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Analysis of Returns and Practices of Florida Fresh Citrus Sales Organizations

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U. S. DEPARTMENT OF AGRICULTURE

by Fred E. Hulse

Farmer Cooperative Service
U. S. Department of Agriculture

Marketing Research Report 345 August 1959

FARMER COOPERATIVE SERVICE
U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON 25, D. C.

Joseph G. Knapp, Administrator

The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, merchandising, product quality, costs, efficiency, financing, and membership.

The Service publishes the results of such studies, confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

This study was conducted under authority of the Agricultural Marketing Act of 1946 (RMA, Title II).

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HIGHLIGHTS

This study determined two things: (1) the nature of sales policies and pricing practices of Florida fresh citrus sales organizations, and (2) the relationship between net returns to shippers and various factors which affect the sale of fruit. Interviews with sales personnel of 18 fresh citrus sales organizations and the sales records of 38 packinghouses selling through these organizations provided data for this study.

Packinghouses were grouped into three major areas--North Florida, Interior and Indian River. Twenty of the houses were operated by cooperatives. Sixteen of the 38 packinghouses sold their fruit through a federated sales agency.

Size and grade of fruit affect net returns to shippers, particularly for fruit shipped to auction markets. In general, during the 1953-54 season, large sized Valencia oranges were discounted while large sized white seedless grapefruit brought premiums.

Slight differences in net returns for Valencia oranges showed Interior area sales to chain buyers returning more than sales to wholesalers and jobbers or to other types of buyers, especially in the case of direct sales. Further analysis indicated that sales made directly to buyers averaged higher returns per box than sales made through brokers and still higher than sales made at auction. These results reflected the costs of additional services performed by brokers and the mixed policies of shippers, some of whom use auctions for quality fruit while others use this outlet as a last resort.

Comparison of white seedless grapefruit returns showed federated and nonfederated sales making comparable returns to shippers. Returns for Interior Valencia oranges were 3 cents a box higher for shippers using federated sales than for those selling through nonfederated organizations. When two houses that shipped a high proportion of natural color fruit were eliminated from the comparison, federated shippers showed even higher net returns, averaging 5 cents a box more than returns of nonfederated shippers.

Volume of fresh fruit shipped by the 38 cooperating houses is shown for size of fruit, grade, containers, method of sale, terms of sale, type of buyer, market location and time.

Marked increases in production have been accompanied by important changes in utilization and marketing practices. Frozen concentrated juices have been the important factor in utilization of this increased production. Fresh shippers have been affected by the inter-product competition which has developed between processed and fresh fruit.

Many large volume buyers have moved their procurement offices to production areas. Some shippers have made efforts to shift their sales programs to service this direct buying and f.o.b. business.

The competitive nature of fresh citrus sales is reflected in a reduction in the number of packinghouses since the post-World War II period from a high of 410 in 1947-48, to a low of 247 in the 1956-57 season. Cooperative shippers made up 25 percent of all certified packinghouses and accounted for 30 percent of the volume of all fruit from houses handling in excess of 50,000 boxes in the 1955-56 season.

Prices for fresh citrus were based on a variety of sources of information, including industry contacts, U. S. Department of Agriculture market news, and "Daily Market Bulletin" of Florida Citrus Mutual, Lakeland. Each shipper valued most highly that source of information showing prices for the sales methods most employed by the organization. Other market information was considered as it related to or influenced supply, demand, and prices.

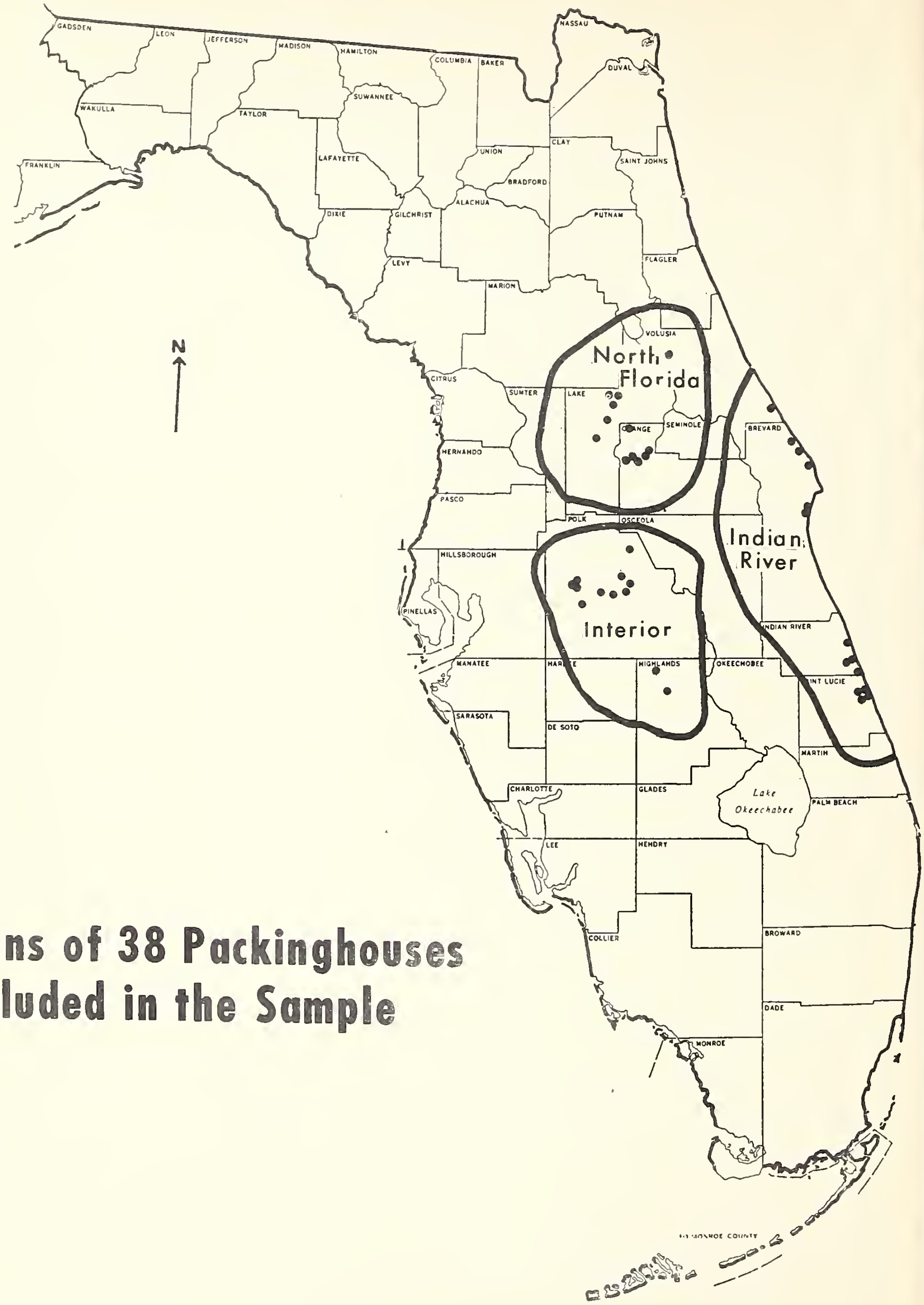
Sales personnel viewed their job as basically involving a three-step operation: contacting the trade, quoting prices, and securing orders. Other services performed, such as issuance of a trade bulletin or sales promotion work, were considered as secondary parts of the sales job or as a responsibility separate from sales work.

Most sales departments attempted to maintain price but the period covered varied from a few days to as long as 30 days or more. Disposal of ''slow moving'' fruit was accomplished by price discounting, use of joint account, consignment or auction methods of sale. Discounting, or the use of differentials, is an accepted industry practice used in pricing different types of containers, different grades, and different sizes. It is sometimes used to distinguish between brands or between natural color and color-add fruit.

The use of brands to identify fruit was usually tied to some form of advertising. Advertising by small organizations was usually beamed towards the wholesale or buying trades. Large organizations did some advertising at the retail level but most of this was in the form of sales promotion work.

The number of salesmen and other sales personnel employed was associated very closely with volume of sales. As total sales increased beyond the 600,000 box level, volume per salesman increased rapidly while volume per clerical worker remained rather constant. This indicated a shifting of routine work from salesmen to clerical worker in larger sales organizations.

The number of brokers used by sales organizations also increased with total volume of sales. In addition to the regular broker services performed, additional industry contacts also became available. Branch sales offices provided much the same services as brokers and auction market representatives, but on an exclusive basis, representing only their own organization.



Locations of 38 Packinghouses Included in the Sample

ANALYSIS OF RETURNS AND PRACTICES OF FLORIDA FRESH CITRUS SALES ORGANIZATIONS

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Changes in production, demand for fruit, buying practices and sales methods are creating problems for shippers who must formulate a sales program designed to serve their individual needs. An analysis of the sales of various organizations, with emphasis upon sales effectiveness as measured in terms of net returns to shippers at the packed box level, will give shippers information that will be useful in building such a program.

In addition to this analysis of sales, it will be helpful to consider the history and background of Florida fresh citrus sales and to examine pricing policies and sales practices of shippers.

Analysis of data collected from shippers is based on records of the 1953-54 season. The results of the analysis apply specifically to the price comparisons for that marketing season. Conclusions based upon these comparisons would be applicable to other years insofar as the same policies were followed.

This study was designed to:

1. Analyze the nature of the market for Florida fresh citrus fruit with respect to pricing policies and sales procedures.
2. Appraise the relationship between net returns to shippers and
    a. Different types of sales organizations,
    b. Methods of sale,
    c. Type of buyer, and
    d. Market distribution.
3. Determine that combination of sales practices which produces best net returns for shippers.

Details of research procedure including method of selecting sample packinghouses and limitations of the study can be found in the appendix. It also contains a detailed description of the methods used in making the net return comparison analysis.

Locations of sample packinghouses are shown on the accompanying map. Of the 38 packinghouses sampled in this study, 20 were operated by cooperatives. Some of these houses operated independent sales departments but 13 organizations used the services of the large federated sales agency.

Note: The author acknowledges the cooperation of the 18 Florida fresh fruit sales organizations and their shipper members for their cooperation in making sales records available. Special acknowledgment is given to Charles K. Baker for initial work performed on the study, and to Homer J. Preston for his guidance and suggestions in developing the work.

For this study, houses were grouped by three major areas, North Florida, Interior and Indian River. This classification placed emphasis on similar production characteristics and the sample of packinghouses was drawn on this basis. Due to similarities in the data from houses in the North Florida and Interior areas, these were grouped together and called Interior houses in reporting results of net return comparisons. However, the analysis did consider the possible variations between areas. The section on volume distribution shows these data for each area separately.

HISTORY AND BACKGROUND OF FLORIDA FRESH CITRUS SALES

The problems of fresh shippers cannot be entirely isolated from those of other segments of the citrus industry. Since these fresh citrus shippers are influenced by the marketing environment in which they operate, an examination of the industry's development in some detail will point out some of the problems they face.

At the end of the 1953-54 season, Florida production of oranges had set a new record of 91.3 million boxes. This was 19.1 million boxes over the previous season and 12.7 million boxes more than the previous record of 78.6 million boxes set two seasons earlier. This record was to stand only 3 years. A new record was set in the 1956-57 season with an orange crop totaling 93 million boxes of oranges. Barring continued adverse weather conditions such as those of the 1957-58 season and new disease or insect problems, new groves hold the promise of breaking these records.

Figure 1 shows production of oranges for Florida, California and the United States. Florida growers have been primarily responsible for the almost constantly expanding United States orange production, while California production of oranges has been relatively stable over the last 20 years. Over the 30-year period ending 1956-57, Florida's orange production has increased nine times to California's one and a half. During the most recent decade of these 30 years, California's production has remained relatively constant while Florida's production has almost doubled.

Production of grapefruit, shown in figure 2, for this same period has also been dominated by Florida growers. Increased production in Texas from the mid-30's to 1949 made that State a major contender for the grapefruit market. Since the 1949, and subsequent freezes, Texas has not been important in the total production picture. Over the 30-year period ending in 1956-57, grapefruit production in Florida increased about four times, while in the most recent decade of that period production has been relatively stable. Trend lines for total United States and Florida production were nearly parallel during the last several years, indicating Florida's strong influence on total supplies.

Tangerine production and utilization, both for fresh and processed purposes, has increased gradually and consistently over the last 30 years, with processing taking a more important share of the crop in the last 10 years.

Utilization of Florida citrus is shown in figure 3. While total production of oranges had increased since the late 30's, the quantity shipped as fresh fruit has remained relatively constant as compared with the volume utilized for processing, especially in the last 10 to 15 years. Quantities of Florida grapefruit sold as fresh have shown some variation in the last 15 years but after the 1949-50 season there was a marked increase in fresh sales, presumably as a result of short supplies of Texas fruit due to the freeze. However, total production of Florida grapefruit has shown only a gradual increase since the late forties. Volume of fruit used for processing has varied some since the 1949-50 season but has accounted for a smaller proportion of total production than in earlier years.

Florida citrus used in processing was responsible for the consumption of large volumes of fruit. Table 1 shows the proportions of citrus used for processing and the proportion of processed used for frozen concentrated juices. Over the past 10 years, frozen orange juice concentrate has accounted for the utilization of large fruit supplies. This product has taken more than 70 percent of all oranges used for processing since the 1952-53 season while all processing has taken over 70 percent of the orange crop since the 1955-56 season.

TABLE 1.--Utilization of Florida citrus fruit for frozen concentrated juices, 1946-47 to 1955-56

Season	Production	Percent processed	Percent of processed used for frozen concentrate
	Oranges		
	Million boxes		
1946-47	53.7	37.0	2.3
1947-48	58.4	52.1	5.3
1948-49	58.3	46.1	31.0
1949-50	58.5	59.3	51.3
1950-51	67.3	62.3	55.3
1951-52	78.6	60.4	66.9
1952-53	72.2	63.6	71.6
1953-54	91.3	68.9	77.3
1954-55	88.4	68.7	73.9
1955-56	91.0	71.3	76.2
1956-57	93.0	73.4	71.7
	Grapefruit		
1949-50	24.2	55.7	13.8
1950-51	33.2	53.8	1.7
1951-52	36.0	38.0	9.7
1952-53	32.5	46.3	8.6
1953-54	42.0	47.8	10.2
1954-55	34.8	45.0	8.4
1955-56	38.3	48.7	13.3
1956-57	37.4	50.9	11.0
	Tangerines		
1952-53	4.9	21.7	46.2
1953-54	5.0	20.8	43.0
1954-55	5.1	21.7	69.2
1955-56	4.7	20.9	56.1
1956-57	4.8	26.2	54.9

Source: Agricultural Marketing Service, U. S. Department of Agriculture.

Frozen concentrate grapefruit juice represented 13 percent of the grapefruit used in processing in the 1955-56 season and 11 percent in the 1956-57 season. These were unusual years inasmuch as this product had consistently accounted for 10 percent or less of the processed fruit except for 1949-50 when it was 14 percent. All processed grapefruit products made up more than 45 percent of total production since the 1952-53 season.

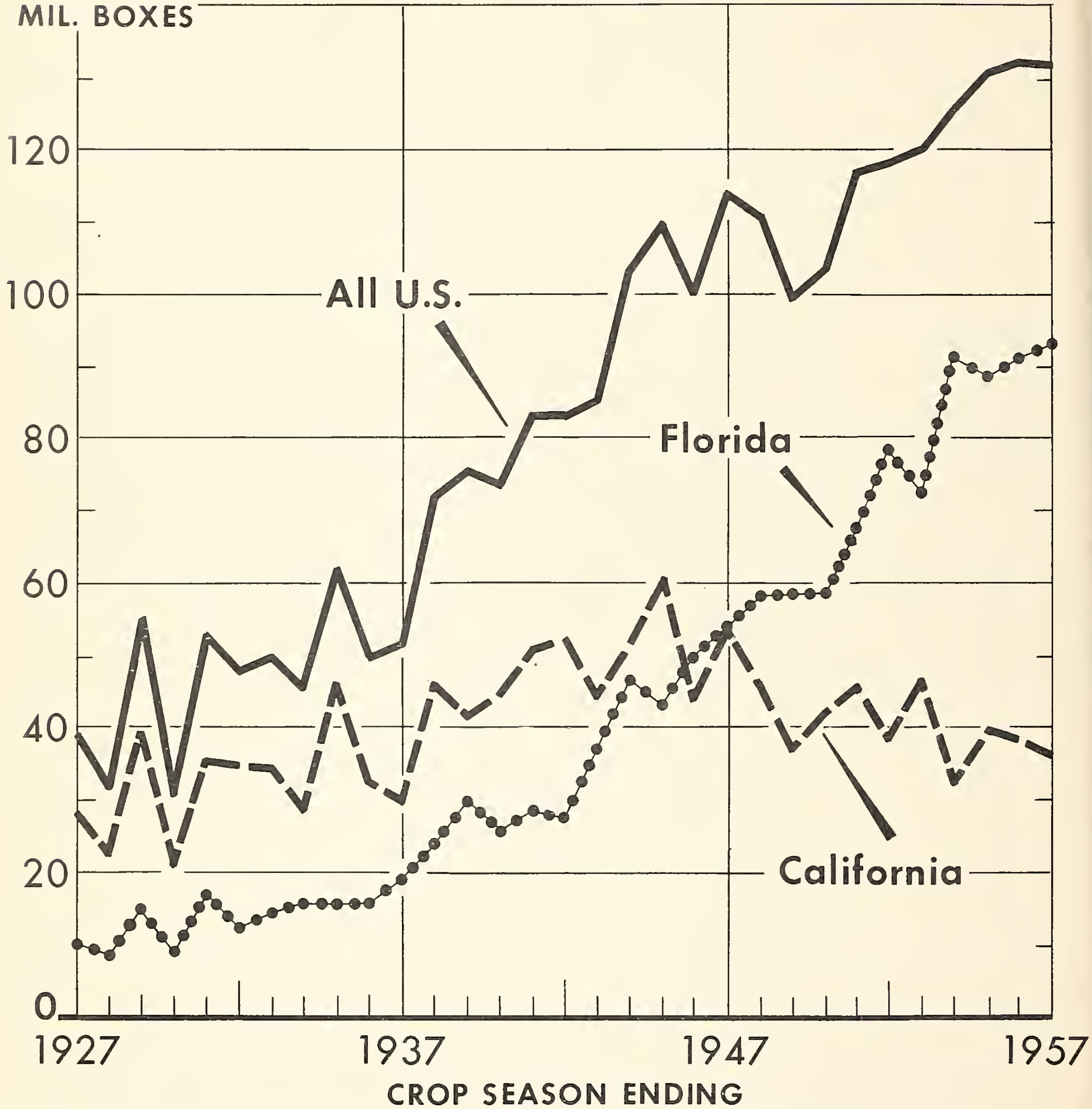
Frozen concentrated tangerine juice is a relatively new product. The proportion of the tangerine crop processed in some form has been about 21 percent until the 1956-57 season when it reached 26 percent. Of the tangerines processed, more than one-half have gone into frozen concentrate in each of the last 3 years.

Citrus processing is not exclusive with Florida but in the 1956-57 season, when 73 percent of Florida's orange crop was used for processed products, only 25 percent of California's orange crop was similarly used. Total volume of oranges used for processing in California reached 8.8 million boxes as compared with 68.2 million boxes of Florida fruit. Some 22 percent of the Texas crop was processed in 1956-57 but this accounted for only 350,000 boxes of oranges.

Consumers have found it possible to substitute processed products for fresh and the added convenience of the processed product has added directly to such substitution. This convenience has also led to increased consumption of citrus products the year-round.

Figure 1

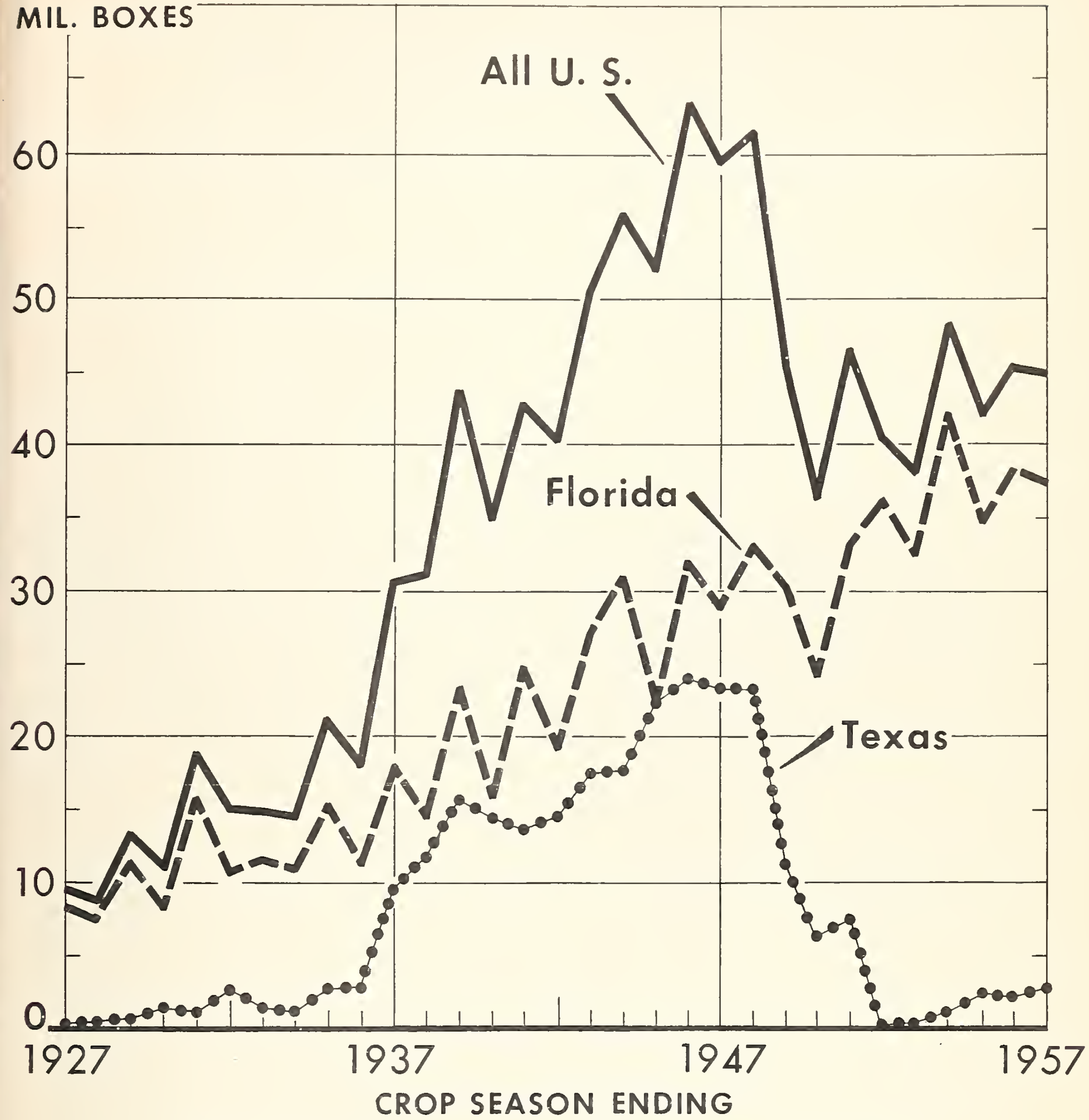
Total Production of Oranges, United States, California and Florida, 1926-27 to 1956-57



SOURCE: AGRICULTURAL MARKETING SERVICE, U. S. DEPARTMENT OF AGRICULTURE

Figure 2

Total Production of Grapefruit, United States, Texas and Florida, 1926-27 to 1956-57



SOURCE: AGRICULTURAL MARKETING SERVICE, U. S. DEPARTMENT OF AGRICULTURE

Figure 3

Utilization of all Florida Oranges and Grapefruit Sold by Seasons, 1933-34 to 1956-57

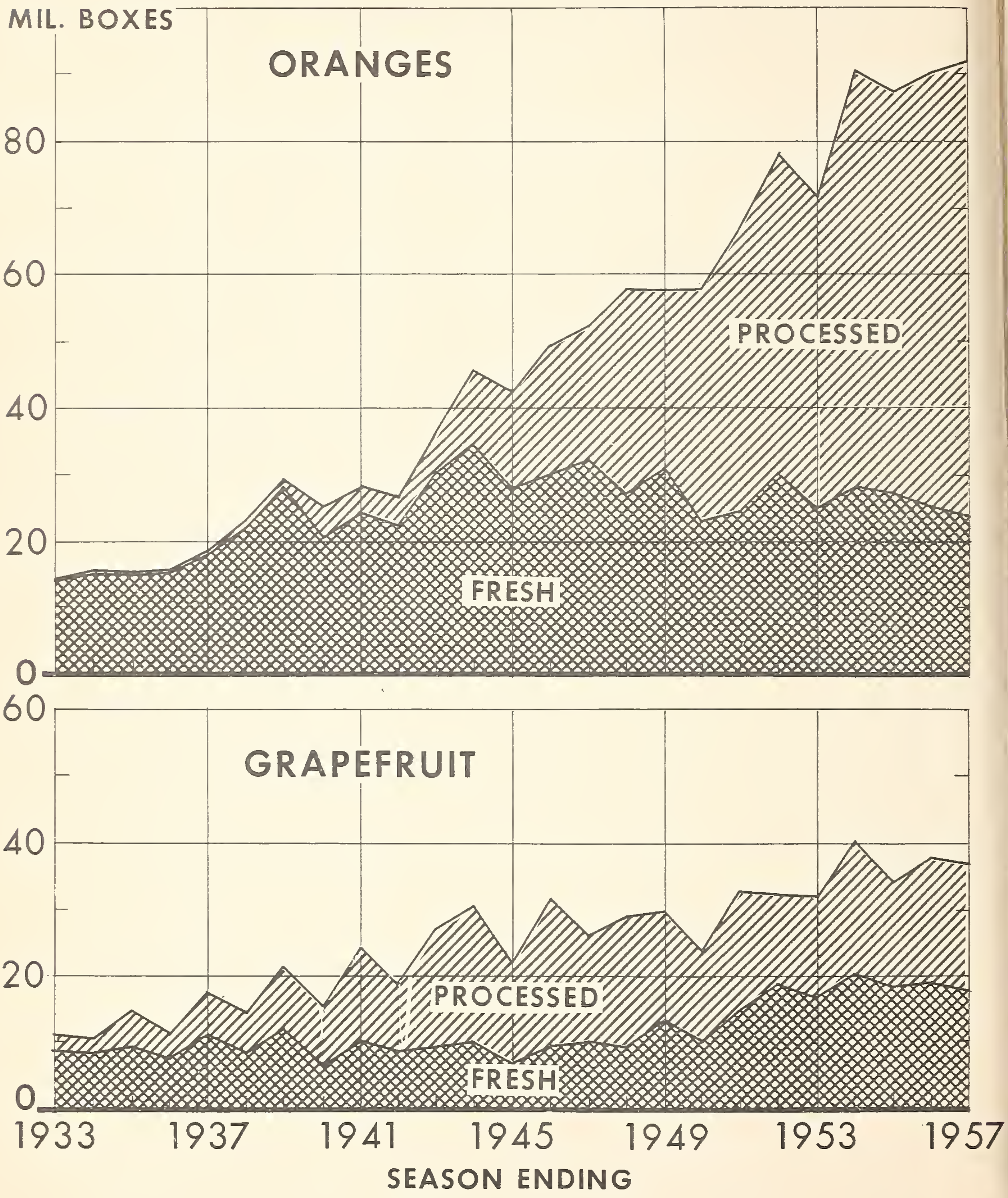
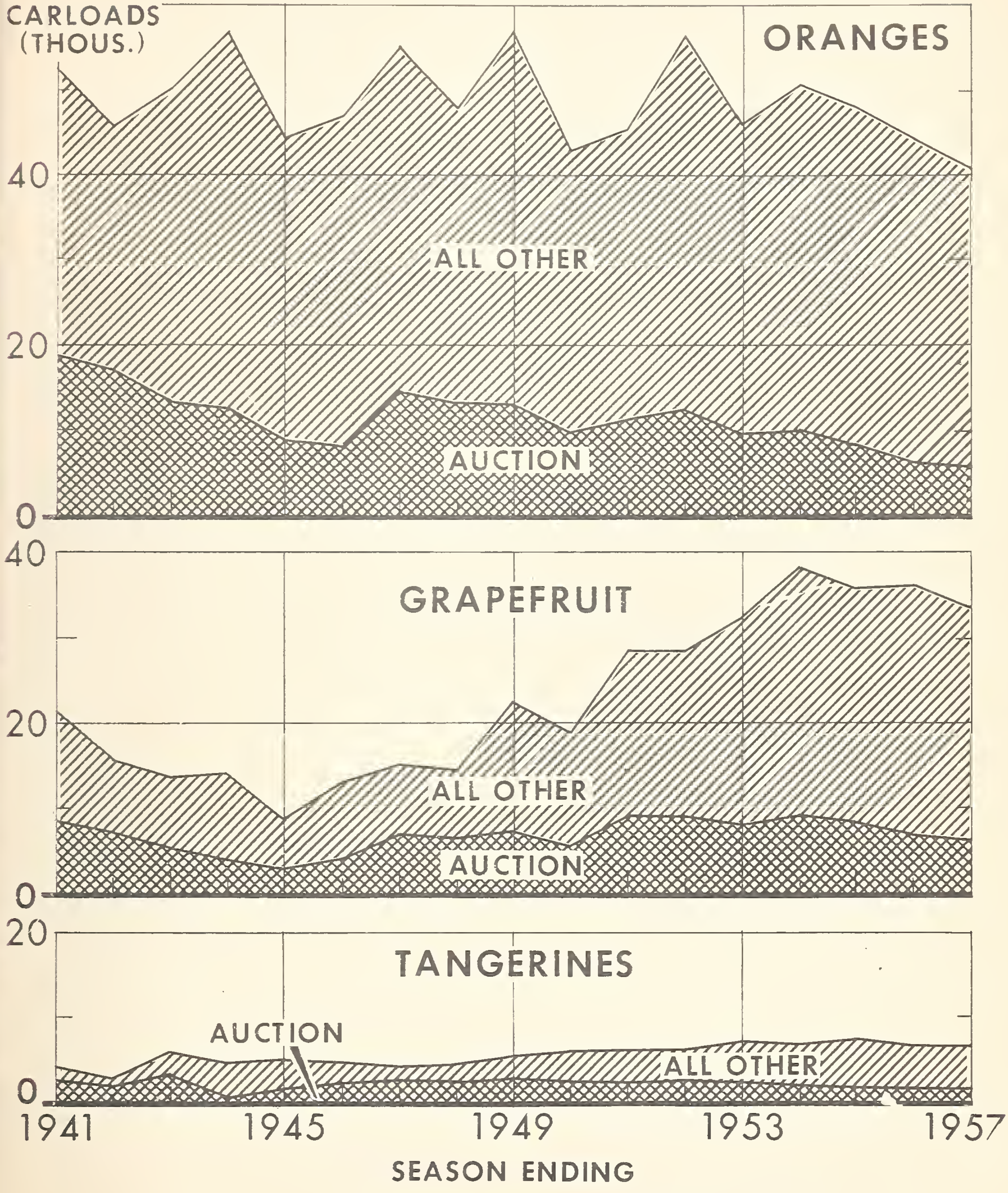


Figure 4

Florida Citrus Sold at Auction as Compared With Total Florida Fresh Citrus Sales



On the one hand, increased use of processed products helps to utilize the increased production of fruit. On the other hand, utilization of these processed products may displace some fresh fruit consumption.

In addition to these problems, other factors are affecting fresh citrus sales. These take the form of buying practices which are displacing once accepted sales methods. In recent years large buyers, particularly chain stores, have established buying offices in the producing areas from which they deal directly with shippers. Buyers have resorted to order buying of specific sizes which has placed the burden of disposal of undesirable sizes on the shippers.

Figure 4 shows the carlots of Florida fresh citrus sold at auction and auction sales as the percent of all fresh fruit sales since 1941. The trend of Florida's auction volume over the last 10 years (1947-57) shows orange and tangerine shipments are generally down and grapefruit volume is generally up. In terms of the proportion of all fresh fruit sales, auction sales have been declining in importance for all these types of fruit during the last 10 years. The declining volume of auction sales indicates the growing importance of other sales methods.

With the declining use of auction markets by Florida shippers in general, some shippers use this method of sale as an emergency outlet. That is, fruit is shipped to auction only when no direct sale or brokerage outlet is available for such fruit. To these shippers the auction market offers a very useful service similar to the commission sale or joint account sale which is frequently used to dispose of slow moving fruit. Insofar as these emergency type auction sales deviate from a regular auction plan, they tend to disorganize that outlet and work a hardship on those shippers that normally and regularly use this method of sale.

Florida fresh citrus packinghouse registrations provide a limited indication of the economic environment surrounding the fresh citrus business. Number of registrations issued in the 16-year period starting with the 1941-42 season are shown in Table 2.

TABLE 2.--Packinghouse registration certificates issued by the Bond and License Division of the Florida Department of Agriculture's Citrus and Vegetable Inspection Division, 1941-42 to 1956-57[1]

Crop season	Number of houses
1941-42	318
1942-43	305
1943-44	321
1944-45	340
1945-46	350
1946-47	376
1947-48	410
1948-49	396
1949-50	372
1950-51	339
1951-52	313
1952-53	288
1953-54	294
1954-55	272
1955-56	256
1956-57	247

[1] Does not include lime packinghouses.

Source: Annual reports of Citrus and Vegetable Inspection Division, Florida Department of Agriculture.

Registrations show a considerable increase during the post-war period (World War II) starting with 318 houses in the 1941-42 season and reaching 410 in the 1947-48 season. The subsequent departure from the business scene of as many packers as entered brought the total down to 313 in the 1951-52 season. This number has declined almost steadily ever since, reaching 247 in the 1956-57 season.

During the season for which sales data were collected for this study, 1953-54, packinghouse registrations numbered 294. Of this number 172 houses, or 58 percent, shipped in excess of 50,000 boxes of certified fruit. Two seasons later, 1955-56, the total number of packinghouses had been reduced to 256 with 146, or 57 percent, shipping in excess of 50,000 boxes. Houses shipping less than 50,000 boxes accounted for 3.4 percent of all certified shipments in 1953-54 and 3.6 percent in 1955-56. They are relatively unimportant volumewise.

This decline in number of packinghouse registrations indicates the economic climate in which fresh Florida citrus is packed, shipped, and sold. The figures cited for this 2-year period represent a 13 percent reduction in the number of registered packinghouses and a 15 percent reduction in the number of packinghouses shipping in excess of 50,000 boxes.

Table 3 provides a comparison of the distribution of houses with that of shipments by these houses for the 1953-54 and 1955-56 seasons. These distributions represent the 172 houses in 1953-54 and the 146 houses in 1955-56 that sold in excess of 50,000 boxes. Only slight variations exist in the distribution patterns of houses or shipments for the two seasons.

TABLE 3.--Percent of houses and percent of shipments compared by volume groups for Florida packinghouses shipping in excess of 50,000 boxes, 1953-54 and 1955-56 seasons

Boxes shipped[1]	1953-54		1955-56	
	Percent of houses[2]	Percent of shipments[3]	Percent of houses[2]	Percent of shipments[3]
1,000 boxes				
900 and over	2.3	9.5	3.4	15.1
600 - 899	4.1	11.9	4.8	11.8
450 - 599	8.1	17.0	6.8	13.2
327 - 449	12.8	18.7	12.3	17.3
200 - 326	23.8	23.9	24.0	23.2
90 - 199	25.6	12.8	29.5	14.9
50 - 89	23.3	6.2	19.2	4.5
Total	100.0	100.0	100.0	100.0

[1] Volume classifications shown are those used in selecting the sample of shippers for study of detailed sales data.

[2] Percentage is based on 172 houses in 1953-54 and 146 houses in 1955-56.

[3] Percentage is based on a volume of 44,497,978 boxes in 1953-54 and 40,123,674 boxes in 1955-56.

Source: Based on data taken from Annual Report of Citrus and Vegetable Inspection Division, Florida Department of Agriculture.

In the 1955-56 season there were fewer houses in the group shipping less than 90,000 boxes and shipments were heavier for the group shipping in excess of 900,000. However, in both seasons 27 percent of the houses shipping 327,000 or more boxes accounted for 57 percent of the shipments of all houses shown. There was some tendency shown in the 2-year interval for large volume houses to gain in proportion of shipments while small shippers lost volume.

An examination of the composition of citrus packinghouses and sales organizations would not be complete without considering the business organization of the various units. Cooperatives handle an important part of the Florida fresh citrus volume, and further, their methods of operation tend to set the pattern for the industry. Among independently operated packinghouses, grower relationships and business methods frequently parallel those of cooperative houses. Grower payment plans operated as pools by both cooperatives and other business organizations are an example of this similarity.

Table 4 presents data on the 1953-54 volume of certified shipments of all Florida packinghouses and cooperative houses. Of 146 shippers, 37 or 25 percent were doing business as cooperatives. These organizations accounted for 30 percent of the volume shipped. Of the 12 houses shipping 600,00 boxes or more, 5 were cooperatives and accounted for 37 percent of the volume handled by all cooperatives. Among houses shipping less than 600,000 boxes, cooperatives showed the same general volume distribution as all other houses. Of 28 houses shipping from 50,000 to 89,000 boxes, there were 3 cooperatives accounting for less than 2 percent of all cooperative volume.

TABLE 4.--Volumes of cooperative shippers compared with volumes of all fresh citrus packinghouses in Florida, shipping 50,000 or more boxes in the 1955-56 season by volume groups

Boxes shipped[1]	All packinghouses			Cooperative packinghouses		
	Number	Certified shipments		Number	Certified shipments	
		Boxes	Percent		Boxes	Percent
1,000 boxes						
900 and over	5	6,080,914	15.1	2	2,302,180	18.9
600 - 899	7	4,730,518	11.8	3	2,175,254	17.8
450 - 599	10	5,280,037	13.2	2	1,129,097	9.3
327 - 449	18	6,930,436	17.3	5	1,956,099	16.0
200 - 326	35	9,305,315	23.2	10	2,617,129	21.5
90 - 199	43	5,974,789	14.9	12	1,803,657	14.8
50 - 89	28	1,821,665	4.5	3	204,135	1.7
Total	146	40,123,674	100.0	37	12,187,551	100.0

[1] Volume classifications shown are those used in selecting the sample of shippers for study of detailed sales data.

Source: Based on data taken from Annual Report of Citrus and Vegetable Inspection Division, Florida Department of Agriculture.

In addition to the individual cooperative packinghouses or citrus associations, two large cooperative sales agencies are functioning in the State. One of these is primarily a citrus sales organization while the other handles other crops in considerable volume. These organizations serve both cooperative groups and large independent growers. All cooperatives shipping citrus are not served by these sales agencies, nor do these agencies control a block of sales so large that they can control the market. However, they do exert a strong influence in behalf of the grower in both the market and production areas.

PRICING POLICIES AND SALES PRACTICES

In studying the effectiveness of fresh citrus sales organizations in Florida, sales managers or other sales personnel of the 18 sales organizations that represented the 38 packinghouses or shippers included in the sample were interviewed concerning pricing policies and sales practices. One group of 16 shippers sold their fruit through a federated sales agency. Another group of four sold through an office maintained by one of their number. Three other houses were jointly owned and sales were managed through a central office.

Another small packinghouse did not maintain an individual sales department as such, nor did it sell through a sales department similar to those used by other shippers. Instead, it followed the practice of sending its fresh fruit directly to auction where a representative handled its sales. All other shippers maintained their own sales departments.

Pricing Policies

Table 5 shows the policies followed and the frequency with which those practices were used by management as policy guides in determining day-to-day prices quoted for fresh fruit. Sales representatives were further questioned about sources of price information immediately available to them, those sources used, and other factors considered in establishing their prices.

TABLE 5.--Practices followed by 18 Florida fresh citrus sales organizations to determine day-to-day prices, 1953-54 season

Practice	Number of organizations that follow[1]
Watch supply and demand	14
Watch competitive prices	5
Watch market information	4
Follow market	2
Follow auction prices	2
Follow auction trends	2
Follow previous day's prices	2
Follow chain store purchases	1

[1] Some organizations follow several of these practices.

All sales organizations interviewed followed a similar policy in establishing prices for fresh fruit. That policy was to keep in touch with all price and supply information concerning those markets most frequently used. Practices used to carry out these policies were so similar that there was little clear distinction between them except to place emphasis upon one type of market or outlet over another. Cost of production and packing was never mentioned as a primary consideration in determining day-to-day prices.

Secondary factors which management considered important in establishing prices included again the supply of and demand for fresh fruit as shown in table 6. This response emphasized the strong conviction on the part of sales and management personnel that these were the primary factors in determining price and that when all other factors were considered, another final look at supply and demand would be desirable. However, some sales people saw influences on fresh fruit prices in the concentrate fruit price, the on-tree price, the cost of packing and quality of fruit.

Sources of price information readily available to sales organizations are listed in table 7. All the usual published data on market prices were recognized by sales personnel as helpful in determining prices. Most important source of this information in terms of its utility was the industry contact used by all of the firms which claimed such contacts. Reports of Florida Citrus Mutual, Lakeland, and the U. S. Department of Agriculture had a proportionately greater use by sales organizations which saw them regularly than any other price reports. In terms of number of sales organizations that had available and used these various sources of information, that of Florida Citrus Mutual had the most

TABLE 6.--Secondary factors considered by management personnel of 18 Florida fresh citrus sales organizations in arriving at daily prices, 1953-54 season

Factor	Number of organizations replying
Supply and demand	11
Concentrate fruit price	3
On-tree price	1
Cost of fruit and packing	1
Quality	1
Views of representatives and brokers	1

extensive use. Mutual's ''Daily Market Bulletin'' reached 16 sales organizations surveyed and was used by 13 in establishing daily prices.

Price maintenance is one of a sales organization's chief concerns. Fresh citrus produced in Florida normally starts the sales season with high prices. These prices taper off as supplies become more abundant. Lower prices tend to increase demand, thus moving the increased supplies. Price under these circumstances serves to equate supplies of citrus with the demand for citrus, one of its basic functions. Buyers may tend to overestimate the supply and underestimate the demand for the purpose of lowering the price. Sellers tend to do the opposite. Thus the shippers' responsibility in following a policy of price maintenance is to know market conditions.

Sales managers were asked if any attempt was made to maintain a uniform price for fruit over any period of time and if so what was the usual period of time. Answers to these questions indicated that there was no uniform policy among all organizations (table 8). Nearly one-half of the organizations did not attempt to maintain prices at all. Of those who did attempt to maintain prices, there was a variation in the time period.

Slow-moving fruit is a term applied primarily to unpopular sizes of fruit which have a limited market. This causes a problem for sales organizations when these sizes are abundant. Retailers want fruit of uniform size and appearance to aid in both display and pricing. Small sizes are in abundant supply in the early part of each fruit season when large sizes are less readily obtainable. As the season progresses this situation reverses and large sizes become more plentiful.

TABLE 7.--Sources of price information available and sources used by 18 Florida fresh citrus sales organizations, 1953-54 season

Price information source	Number of organizations that have		Percent used
	Available	Used	
Industry contacts	11	11	100
Market price information			
Florida Citrus Mutual	16	13	81
Auction market prices	13	6	46
Other market prices	4	1	25
U.S.D.A. market news	5	4	80
Two or more of the above sources	18	12	67

TABLE 8.--Sales organization practices in attempting to maintain a uniform price over time, 1953-54 season

Practice	Number of sales organizations
Do not attempt to maintain price	8
Attempt to maintain price	10
As long as possible	5
As long as 30 days for f.o.b.	1
Two weeks	1
One week	1
Three or 4 days	1
When market is weak	1

Sales organizations interviewed indicated that one or more of three methods were used to sell slow-moving fruit. Most important was the price discounting of unpopular sizes. This was used by 11 organizations. Second most important method of moving these sizes was the use of outlets such as commission houses and auction sales, especially for those organizations which normally sell direct or through brokers. This method was used at some time by six organizations. One sales department indicated that it moved unpopular sizes by "forcing" buyers to take all sizes. Those organizations selling at auction did not have as much of a problem with unpopular sizes as those selling through brokers or making direct sales since less popular sizes sought their own price level in the auction.

Oranges, grapefruit and tangerines are sold on a basis of grade and size. All sales agencies contacted in this study reported that prices are quoted on the basis of the U.S. No. 1 grade. The bulk of the fruit from the Indian River area is graded U.S. No. 1 Golden, U.S. No. 1 Bronze, or U.S. No. 2, as contrasted with interior fruit, the bulk of which is graded U.S. No. 1 or U.S. No. 2. With some minor exceptions, oranges shipped out of the State must grade U.S. No. 1 or some variation thereof, except for a few weeks at the very beginning or end of the season. Therefore, prices would normally be quoted on a U.S. No. 1 basis.

Grapefruit for the season surveyed entered interstate trade as either U.S. No. 1 or U.S. No. 2 fruit. Price quotations for grapefruit will usually show a price differential for differences in grade.

Sales organizations reported usual price differentials based on grade as indicated in table 9.

TABLE 9.--Number of sales departments[1] which had usual price differentials based on grade, 1953-54 season

Price differential between grades per box	Number of organizations reporting price differentials for:		
	Oranges	Grapefruit	Tangerines
25 to 50 cents	3	10	6
One dollar	0	0	2
Varies with price	1	1	1

[1] Two of the 18 sales organizations did not report a "usual" price differential for grades.

Price differentials as used by many sales organizations were not considered usual or fixed differentials but were fitted to the price and supply situation at the time prices were quoted.

Usual price differentials based on size of fruit were reported by about one-half of the sales organizations included in the sample. All sales agencies reporting price differentials based on size indicated that these applied to all grades and depended upon the supply of those sizes usually discounted. Discounts allowed for size of fruit ranged from 25 cents to $1, greater discounts being allowed as prices of fruit increased.

Fruit packed in various types of containers were priced to cover the differences in quantity of fruit, cost of container and packing. Florida Citrus Mutual's suggested schedule of differentials for pricing fruit in bags and cartons was followed by most sales agencies. These differentials are shown in table 10. Exceptions to these suggested differentials were made most frequently in pricing 5 and 10 pound bags of grapefruit.

TABLE 10.--Price adjustments for various containers used by Florida citrus shippers in the 1953-54 season

Container	Oranges		Grapefruit	
	Add to base price	For unit price divide by	Add to base price	For unit price divide by
	Cents		*Cents*	
1 3/5 bushel bruce box (wirebound)	([1])	([1])	([1])	([1])
1 3/5 nailed box (standard)	25	1	25	1
4/5 bushel bruce box[2]	40	2	30	2
4/5 bushel nailed box[2]	45	2	40	2
1/2 box export carton	12	2	12	2
1/2 box telescope carton	10	2	10	2
1/2 box domestic carton (conventional)	5	2	5	2
20 pound mesh bags	15	4	10	4
8 pound mesh bags	27	10	25	9
5 pound mesh bags	55	16	50	14

[1] Priced at base price which includes cost of fruit and container.

[2] Differentials used by one interior area sales organization, and not included in Mutual's suggested differentials.

Source: Suggested minimum differentials for bag and carton packed fruit compiled by Florida Citrus Mutual, Lakeland, Fla.

The primary function of a brand is to identify fruit with a particular shipper or sales organization and to further identify a particular type and quality of fruit. Brands are used to differentiate between grade, type or variety of fruit, quality within grade, color-add fruit and a variety of other minor uses such as special brands for bagged fruit or type of container, for Christmas season packs or to give a particular customer or type of outlet exclusive use of a brand in a particular market. Table 11 shows the relative importance of brand functions to the 18 sales organizations cooperating in this study.

Most sales organizations had no established price differential for brands as a usual custom. Three organizations contacted did have such a differential. However, where brand was tied to some other fruit quality, such as grade, color-add or variety, a usual price

TABLE 11.--Number of sales organizations using brands for various functions, 1953-54 season

Brand used to differentiate:	Number of organizations using brand for function
Grade	18
Type or variety of fruit	[1] 8
Quality within grade	6
Outlets	4
Market cities	4
Color-add fruit	2
Buyers	1
Other brand function	([2])

[1] Four out of eight sales organizations used all brands in this manner while the other four identified only a part of their brands with type or variety of fruit.

[2] Brands were used for five other functions, each function by a different sales organization as follows: Special brands for bagged fruit; special Christmas brand; Indian River area organization uses special brand for bruce box; second brand used for second customer in one market; second brand used for second outlet in one market.

differential was probably related more to other factors than to the brand used to identify it. In actual practice the price differential was probably tied to a combination of factors.

Brands are of particular importance to the packinghouse or sales organization that is attempting to build a quality pack and/or is undertaking an advertising or sales promotional program. Their use to distinguish between grades of fruit, quality within grade, or color-add fruit make possible quick quality identification. It is only with the use of a brand which means something to the trade that an advertising program can be effective for a product which has so homogeneous an appearance as does citrus.

Sales Practices

Sales organizations performed many functions which helped to move fruit from packinghouse to market place. When questioned about these functions, sales representatives indicated three which served this purpose: contacting the trade, quoting prices and securing the order. Table 12 gives a measure of the importance with which these steps

TABLE 12.--Number of sales organizations which explained their sales operation as serving various functions, 1953-54 season

Function	Sales departments performing function
Contact trade	17
Quote prices	5
Secure orders	3
Sales promotion	2
Issue weekly bulletin	1

in selling were considered. One organization included in the sample did not have a sales department which functioned in the sense that it actually sold fruit to the trade. All other sales units, 17, reported that they contacted the trade. In addition, five reported that they quoted prices and three reported securing orders.

Obviously all sales organizations accomplished all three of these jobs, but many thought in terms of contacting the trade as the overall or total process. Two other functions were listed as sales department responsibilities. Two organizations included sales promotion and one issued a weekly bulletin to the trade. The latter might be considered public relations work.

The various sales organization functions were carried out by a staff of sales and clerical personnel and, in many cases, with the aid of brokers located in markets or areas served. Number of salesmen and clerical employees was determined in large measure by volume of fruit sold. Table 13 shows the total and average number of personnel employed by the 18 sales organizations surveyed in this study. Total and average number of both salesmen and clerical employees doing sales work increased with increasing volume of sales except for 1.2 million boxes and over.

Variations in the relationship of average number of salesmen to clerical employees can be explained by the fact that some clerical functions can frequently be assumed by salesmen or can be shifted to other employees. Exclusive use of auction sales reduced

TABLE 13.--Total and average number of salesmen and clerical personnel employed according to volume of fruit sold by 18 sales organizations, 1953-54 season

Total volume of sales	Number of sales organizations	Total and average number of			
		Salesmen		Clerical employees	
		Total	Average	Total	Average
1,000 boxes					
50 - 89	1	[1] 1	1.0	[3] 1	[3] 1.0
90 - 199	3	[2] 2	[2] 0.6	[3] 3	[3] 1.0
200 - 326	2	2	1.0	2	1.0
327 - 449	2	2	1.0	2	1.0
450 - 599	1	3	3.0	1	1.0
600 - 899	4	7	1.8	6	1.5
900 - 1,199	4	10	2.5	14	3.5
1,200 and over	1	8	8.0	23	23.0
Total	18	35	1.9	52	2.9

[1] The general manager of this sales organization was the sales manager. Sales accounted for less than his full time.

[2] One organization in this group did not have an active sales force but sold at auction exclusively. It is included in calculating the average.

[3] Clerical employees in three organizations spent only part-time on sales work and probably did not average as high as these figures indicate.

The clerical staff can be used to reduce the workload of the sales staff and increase the salesmen's efficiency.

the need for extensive sales forces, particularly salesmen, in some organizations. Additional salesmen were added to staffs of some Indian River sales departments with increased emphasis upon direct (free on board) sellings in that area.

Average volume of sales for salesmen and clerical employees by total volume of sales is shown in table 14. For sales departments with a business volume of 450,000 or more boxes, there was an average of more than one salesman for each sales organization. Up to this point, volume of sales handled by one salesman was the total volume of the organization. However, from the 450,000 box sales level on up, volume of sales per salesman continued to average higher with each increasing sales volume bracket. Volume per salesman rose rapidly from 198,000 boxes for an organization in the 450,000-599,000 box group to 1,172,000 for an organization in the 1,200,000 plus box group.

Average volume of sales per clerical worker in sales work increased in much the same manner as the volume per salesman. Clerical workers averaged one worker per sales unit up to the 600,000 box level of total sales with this average rising rapidly for each succeeding volume level.

Average volume of sales per salesman increased at an accelerating rate while average volume of sales per clerical employee increased at a constant rate. Increasing volumes of business allowed for more specialization and for some shifting of clerical duties from salesmen to clerical worker in larger organizations.

One sales organization operating out of the Indian River area employed two merchandising people in addition to its regular sales staff. The largest sales organization included in the study had two groups of shippers, each of whom undertook to finance a sales promotion program employing together some six merchandisers. A third organization surveyed conducted sales promotion activities through its nationwide distribution system for both fruits and vegetables.

TABLE 14.--Average volume of sales per salesman and clerical worker employed by 18 sales organizations in 1953-54 according to total volume of sales

Total volume of sales	Number of sales organizations	Volume of sales per salesman		Volume of sales per clerical employee	
		Range	Average	Range	Average
1,000 boxes		*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
50 - 89	1	[1] 75	[1] 75	[3] 75	[3] 75
90 - 199	3	[2] 100-147	[2] 123	[3] 73-126	[3] 100
200 - 326	2	230-325	278	115-162	138
327 - 449	2	381-392	386	190-196	193
450 - 599	1	198	198	148	148
600 - 899	4	341-750	480	136-375	266
900 - 1,199	4	323-1,178	654	168-282	226
1200 and over	1	1,172	1,172	303	303
Total	18	75-1,178	444	73-375	192

[1] The general manager of this organization was the sales manager. Sales accounted for less than his full time.

[2] Figures do not include one organization which did not have an active sales manager.

[3] Clerical employees in these organizations spent only part-time on sales work and probably did not average as high as these figures indicate.

Most sales organizations depended in some part on broker contacts to maintain a sales program. Sales personnel interviewed indicated that both actual sales and market information were provided through brokers. The number of brokers used by individual sales organizations is always subject to change especially with large sales agencies that have contacts in many markets. Table 15 shows the number of brokers used by sales organizations, as estimated by sales personnel, according to volume of sales. Obviously as volume of fruit handled by a sales organization increased, the demand for broker's services increased. In general, average number of brokers used by sales organizations also increased with volume of business.

Brokers used by Florida shippers covered the eastern half of the United States with the heaviest coverage in the northeast and east north central areas. As indicated in table 16 local brokers with headquarters in Florida worked with 7 out of 18 sales organizations contacted. In general, it was the smaller sales unit that used these local brokers while the larger organizations depended more on brokers in the market cities.

Sales personnel interviewed indicated that brokers served five general functions: they (1) contacted the trade, (2) secured orders, (3) made up pool shipments, (4) reported to shippers on market conditions, and (5) represented the shipper when service was needed. All 17 sales organizations using brokers indicated that the latter served functions 1 and 2, contacting trade and securing orders. Out of the 17 organizations, 5 were served by brokers that made up pool shipments, 6 were represented by brokers when service was needed and 2 reported that brokers were a source of market information. The last of these is probably so obvious that organizations failed to note it as a specific service.

TABLE 15.--Total and average number of brokers used by 18 sales organizations by total volume of sales as estimated by sales representatives, 1953-54 season

Total volume of sales	Number of sales organizations	Total number of brokers	Average number of brokers per organization
1,000 boxes			
50 - 89	1	5	5.0
90 - 199	3	[1] 20	[1] 6.7
200 - 326	2	[2] 25	[2] 25.0
327 - 449	2	[3] 12	[3] 12.0
450 - 599	1	25	25.0
600 - 899	4	99	24.8
900 - 1,199	4	201	50.2
1,200 and over	1	101	101.0
Total	18	488	[4] 30.5

[1] One organization reported using no brokers, but it is included in determining the average.

[2] Return from one house only an average for one unit only.

[3] Returns from one unit indicated an indefinite number of brokers are used and is not included in determining the average.

[4] Average of 16 organizations.

TABLE 16.--Location of important brokers serving sales organizations surveyed, 1953-54 season

Broker locations	Number of sales organizations using brokers in area
All of United States[1]	5
New York and Pennsylvania	7
Illinois, Michigan, Minnesota and Wisconsin	7
Tennessee, Virginia and West Virginia	5
New England	3
Louisiana, Texas and Colorado	3
Ohio	3
Kansas and Iowa	2
Canada	4
Local[2]	7

[1] All of United States in effect means broad coverage in those areas served by Florida shippers.

[2] Local brokers were local only in the sense that they operated from local Florida offices. These brokers served many areas of the United States.

However, as indicated earlier, industry contacts were rated high by 11 sales organizations as a source of price information. Brokers in distant markets met a particular need for market information from the areas they represented.

Brokers in a few instances served as auction market representatives. Usually the job of auction market representative was handled by an individual or firm specializing in this type of sale.

Some sales organizations had branch sales offices that performed the function of the auction market representative. In actual practice, these branch sales office served in the capacity of broker by performing those services that a broker or auction market representative would usually perform. However, branch sales offices represented their organizations exclusively. Brokers or market representatives, on the other hand, usually represented several shippers. A small shipper's volume was usually not large enough to enable a broker to offer exclusive service or to permit such a shipper to establish a branch sales office. Three sales organizations cooperating in this study which operated branch sales offices had either large volume sales or supplemented citrus sales with sales of other produce.

Dealer service arrangements provided primarily for servicing dealers and jobbers with display and promotion materials. Three of the organizations cooperating in this study employed fieldmen to provide this service. Cities in the Northeast and Midwest were covered by all three organizations offering this service.

Salesmen connected with each of the sales organizations contacted visited market cities. All shippers that maintained sales departments sent their salesmen to market cities to visit old customers and make new contracts. Two organizations called this "viewing market needs." Usually these visits were made on an annual basis but a third of the sales departments contacted resorted to an every other year or "as needed" basis for making personal contacts in the markets. These trips were made mostly in the summer months after the closing of the season's business and before the new season began. All organizations agreed that these trips were helpful in maintaining market contacts.

Fourteen of the 18 sales organizations contacted did some form of advertising (table 17). Many of the organizations used several advertising media.

Newspaper advertising was used by 4 sales organizations of the 18 contacted. All of these were large volume units except one that used newspaper ads in connection with a

TABLE 17.--Number of sales organizations using various forms of advertising media, 1953-54 season

Media	Number of sales organizations
Trade papers	13
Point of sale	7
Newspapers	4
Radio	2
Television	2
Local for public relations	2
Magazines	1
Number that did not advertise[1]	4
Number of sales organizations	18

[1] Of the number that indicated no advertising it is believed that some may have used trade papers to a limited extent.

special in-store promotional arrangement. Only two of the sales organizations contacted used radio and television, and these were large volume units with nationwide coverage. One of these sales departments also used magazines. Two of the organizations used the local public relations type of advertising. Other organizations may well have been using this type of advertising and calling it public relations. In any event it usually represented very small expenditures.

Advertising of citrus presents many problems not encountered in advertising many processed food products, such as breakfast foods, which offer opportunities for product differentiation. With citrus, differences in quality or other fruit characteristics are not easily distinguished by the customer, especially at the retail level. This problem was attacked by imprinting the skin of the fruit with a brand name, trademark, or production area name such as Florida or Indian River. With the actual fruit identified in this way, it is possible to direct advertising at the retail level more effectively. Without this advantage, advertising by an individual sales organization may well have as much effect on sales of all citrus as upon the sales of the individual organization.

On the other hand, brand advertising directed at the wholesale trade can be tied to brand names or labels which are attached to each container of fruit. Wholesale buyers observe condition and quality of fruit and learn to associate these with particular brands or shippers. Small shippers are most likely to put their advertising dollar in the trade papers where it will do the most to bring their product to the attention of the wholesale trade.

Mass media such as newspapers, radio and television are more suited to the needs of large volume shippers. Point of sale material for use at the retail level can suit the needs of either group.

Out of those sales organizations contacted, 14 used some form of advertising and 13 stressed brand or trademark, 6 stressed quality and 5 stressed type of fruit. Eight of the 14 organizations stressed some combination of brand, quality and type of fruit.

Advertising of Florida citrus products was not as limited as the foregoing description of individual sales organization activity would indicate. The Florida Citrus Commission is charged with responsibility for industrywide advertising and promotional programs. These are supported by a per box retain on all fruit sold for either fresh or processed use.

Progressive Practices

Many of the activities thought to be progressive or effective are possible only in larger organizations. Efficiency in the use of sales and clerical personnel improve as volume of sales increases, as market distribution, particularly broker coverage, increases, and as the opportunities to advertise and develop market information needs are all more easily realized.

Progressive sales policies often come as "package deals." This package represents that combination of practices which produce for the shipper the best possible overall return, not only in the short run but over the long run period. Each shipper cannot always use the same combination of practices for effective fresh sales operations but, in general, progressive practices can be listed as follows:

1. Know market condition in every detail--supply, demand, and price for all types of outlets including the processed market.

2. Price fruit as market conditions warrant considering grade, type of container, fruit sizes, and the need for price differentials.

3. Use brands or trademarks or both, to their fullest potential in promoting sales. The use of special brands for particular purposes appears advisable but the total number of brands used should not exceed the sales organization's ability to use them effectively.

4. Take advantage of any practices which are generally used only by large volume organizations, such as shifting paper work from salesmen to clerical workers, and undertaking sales promotion work.

NET RETURN COMPARISONS

A number of variables including size of fruit, grade, method of sale, type of buyer, and type of sales organization are considered to have some effect upon citrus prices and thus upon net returns to shippers. Net return is the price received by the shipper at the packinghouse door for the fruit after he packs it. It is his payment for packed fruit after all selling, transportation and other marketing costs have been deducted from gross sales price, but does not include deductions for picking, hauling to packinghouse or packing of fruit.

The analysis which follows compares net returns for Valencia oranges and for white seedless grapefruit as they are affected by some of these variables. The framework for the analysis is described in detail in the appendix on page 56.

In brief, the analysis was performed by comparing average net returns per box for lots of fruit identical in all respects except for the variable being compared. Each such comparison of identical lots of fruit was called an observation or matched lot observation. An observation could produce three possible results. For example, comparison of fruit sizes could show one size bringing net returns equal to, more than, or less than another size.

Differences found in the individual observations were totaled and the average net return difference was calculated for the comparison. Individual observation differences had considerable range but are not shown since they were not considered a reliable indicator of dispersion of differences, primarily because they tend to emphasize the extreme differences and ignore the pattern of distribution differences.

Average net return differences were considered in terms of the statistical significance of the distribution of observations from which they were calculated. Each distribution of net return comparisons was tested for significance using two criteria. First, there had to be a significant number of observations showing a net return difference as contrasted with observations showing no net return difference. Second, of the observations showing a net return difference, a significant number had to show one factor receiving net returns either more than, or less than, the other factor with which it was compared. This is referred to as direction of net return differences.

In the comparisons that follow, results were found to be statistically significant if (1) significantly more than two-thirds of all observations showed some differences and (2) significantly more than one-half of these differences were in the same direction. The conventional 5 percent level of significance was accepted as the standard in this analysis.

When statistical significance is established for a comparison, the reader can assume that similar results would occur 95 out of 100 times if the comparison is repeated under similar conditions. Variations from the established results would tend to be slight.

On the other hand, comparisons for which significance could not be established under the limitations set in this analysis give some indication of existing net return differences, but do not provide a basis for assuming a high proportion of comparable results in repeated comparisons. Wide variations from reported results might be expected under these circumstances. Data for which statistical significance could not be established are presented here because they at least provide some basis for making a marketing decision.

Results of net return comparisons that cannot be established as statistically significant will sometimes show larger average differences than those for which significance has been established. Size of net return differences is not the consideration in measuring statistical significance. Here significance is a measure of the reliability with which indicated results can be expected to reoccur when the comparison is repeated. Some information, of value and interest, can be found in these non-significant results but these must be used with a full understanding of the limitations set forth here.

Tables which follow show in summary form the results of these comparisons for each variable considered. A work table showing in detail the comparison of net returns for two fruit sizes is included in the appendix along with a detailed explanation of the method of analysis.

The number of observations on which net return comparisons are based are shown in appendix tables 2-13.

In the following tables and discussion, data from packinghouses in the North Florida and Interior areas are summarized together. Actually under most conditions these two areas are considered as the Interior area, but for the purposes of this study, an effort was made to have sample packinghouses located as near together as possible. Thus, packinghouses in these two areas were classified separately. However, summary of these data on the basis of one area presents no particular problem of analysis and makes possible a better presentation of results.

Net returns were the prices received for the packed fruit at the packinghouse door.

Data collected covered a total of 12 sample weeks in the case of white seedless grapefruit and 6 sample weeks in the case of Valencia oranges. Also, for this 1953-54 season, the 1 3/5 bushel box used in the Interior area was a wirebound while that used in the Indian River area was a nailed box. This limits comparisons between these areas.

Size of Fruit

Size of fruit affects citrus prices, and thus net returns received by shippers. Quotations for citrus always indicate size as a price influence either by showing prices for several individual sizes, or by indicating the range of sizes over which one price will apply. As indicated earlier in this report, sales personnel recognized that some fruit sizes were less desirable than others, and prices were expected to vary accordingly.

The comparisons which are tabulated in the following tables examine net return differences between the four important sizes of white seedless grapefruit and Valencia oranges. White seedless grapefruit sizes (64, 70, 80, and 96--large to small) accounted for 89 percent and the Valencia orange sizes (150, 176, 200 and 216--large to small) accounted for 78 percent of all sizes of these fruit shipped by the cooperating shippers in the period covered. Available data indicated that all methods of sale, auction, broker and direct, took about the same share of all sizes of these fruits including the discounted sizes.

Data assembled by the growers and shippers administrative committees on 1953-54 shipments to auction markets showed no marked price breaks for minor fruit sizes except size 112 white seedless grapefruit which accounted for less than 1 percent of all this variety shipped from the State. Sizes 96 and 112 Valencia oranges also showed considerable discounts over more popular smaller sizes but accounted for only 0.1 percent of all this variety shipped from the State. On this basis, it is believed that net return differences between important fruit sizes analyzed in this study are based on fruit prices which had not been affected by depressed prices for less desirable sizes.

Comparisons are made here for consecutive sizes. Differentials between other sizes can be determined by totaling differences for these comparisons.

Table 18 compares average net returns for 4 important sizes of white seedless grapefruit and Valencia oranges shipped from 23 Interior packinghouses. This table includes data for auction, broker and direct sales. In general, size comparisons show statistically significant net return differences for only two consecutive sizes of either white seedless grapefruit or Valencia oranges as shipped from this area.

Size 96 white seedless grapefruit was discounted an average of 10.6 cents over size 80 fruit. On the basis of marketing periods representing early, midseason and late shipments, net return differences for size 80 and 96 fruit were greater in the early sample weeks or 17.5 cents, about half as large in the midseason period or 8.8 cents, and small in the late season period. Differences in this last period were not statistically significant.

This seasonal pattern in net return differences can reasonably be explained by the availability of more large sized fruit as the season progresses. This pattern is also noticeable in the comparison of returns for sizes 70 and 80 fruit.

TABLE 18.--Comparison between net returns for selected fruit sizes, Florida Interior white seedless grapefruit and Valencia oranges sold through brokers, direct and at auction to all types of buyers (U. S. No. 1 fruit, packed in 1-3/5 bushel wirebound boxes, 23 packinghouses, 1953-54 season)

Type of fruit	Marketing period	Average net return[1]		
		Dollars per box		
		Size 64 compared with size 70		Difference
White seedless grapefruit	Early	2.504	2.454	+ .050
	Mid	2.157	2.102	+ .055
	Late	2.270	2.226	+ .044
	All	2.320	2.270	+ .050
		Size 70 compared with size 80		Difference
	Early	2.453	2.340	+ .113
	Mid	2.084	2.033	[2] + .051
	Late	2.180	2.213	- .033
	All	2.263	2.207	+ .056
		Size 80 compared with size 96		Difference
	Early	2.284	2.109	[2] + .175
	Mid	2.090	2.002	[2] + .088
	Late	2.173	2.142	+ .031
	All	2.181	2.075	[2] + .106
		Size 150 compared with size 176		Difference
Valencia oranges	All	2.644	2.802	[2] - .158
		Size 176 compared with size 200		Difference
	All	2.853	2.893	- .040
		Size 200 compared with size 216		Difference
	All	2.876	2.906	- .030

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[1] Differences in average net returns for a given variable are caused by differences in lots of fruit that could be matched in each comparison.
See appendix pages 56-59 for further explanation.

[2] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

Although net return differences were neither great nor statistically significant for comparisons of sizes other than 80 and 96, there was always a higher return for the larger sized white seedless grapefruit.

Net return comparisons for Valencia oranges shipped from the Interior area showed only two consecutive sizes with a statistically significant net return difference. Size 150 fruit showed an average discount of 15.8 cents over size 176 fruit.

All size comparisons for Valencia oranges showed a net return difference indicating higher returns for smaller sized fruit. This is in contrast with similar comparisons for white seedless grapefruit where larger sized fruit always showed a higher return.

Returns to Interior shippers for auction sales have been isolated from other returns and are compared in table 19. Net return differences were larger than differences observed in two size comparisons for all types of white seedless grapefruit sales. All season comparisons of sizes 64 and 70 fruit showed a difference of 20.6 cents, and sizes

TABLE 19.--Comparison between net returns for selected fruit sizes, Florida Interior white seedless grapefruit and Valencia oranges sold at auction to all types of buyers (U. S. No. 1 fruit, packed in 1-3/5 bushel wirebound boxes, 23 packinghouses, 1953-54 season)

Type of fruit	Marketing period	Average net return[1]		
		Dollars per box		
		Size 64 compared with size 70		Difference
White seedless grapefruit	Early	2.819	2.438	[2] + .381
	Mid	1.792	1.671	+ .121
	Late	2.012	1.868	+ .144
	All	2.159	1.953	[2] + .206
		Size 70 compared with size 80		Difference
	Early	2.520	2.259	+ .261
	Mid	1.719	1.712	+ .007
	Late	1.830	1.807	+ .023
	All	1.995	1.906	[2] + .089
		Size 80 compared with size 96		Difference
	Early	2.300	2.114	+ .186
	Mid	1.872	1.972	- .100
	Late	1.991	1.902	+ .089
	All	2.071	2.008	+ .063
		Size 150 compared with size 176		Difference
Valencia oranges	All	2.557	2.728	[2] - .171
		Size 176 compared with size 200		Difference
	All	2.770	2.948	[2] - .178
		Size 200 compared with size 216		Difference
	All	2.959	3.011	- .052

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[1] Differences in average net returns for a given variable are caused by differences in lots of fruit that could be matched in each comparison. See appendix pages 56-59 for further explanation.

[2] Statistically significant--for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

70 and 80 fruit showed an 8.9 cents difference. Comparison of net returns for size 80 with size 96 fruit showed smaller difference for auction sales than for all sales. Also net return differences for the larger size comparisons, 64 with 70 and 70 with 80 showed statistical significance.

As with all sales, auction sales continued to show larger size grapefruit with higher net returns than smaller sizes. The seasonal pattern of larger early season net return differences also continued.

TABLE 20.--Comparison between net returns for selected fruit sizes, Florida Interior white seedless grapefruit and Valencia oranges sold through brokers and direct to all types of buyers (U.S. No. 1 fruit, packed in 1-3/5 bushel wirebound boxes, 23 packinghouses, 1953-54 season)

Type of fruit	Marketing period	Average net return[1]		
		Dollars per box		
		Size 64 compared with size 70		Difference
White seedless grapefruit	Early	2.470	2.455	+0.015
	Mid	2.225	2.182	+ .043
	Late	2.303	2.272	+ .031
	All	2.343	2.314	+ .029
		Size 70 compared with size 80		Difference
	Early	2.444	2.351	+ .093
	Mid	2.176	2.114	[2] + .062
	Late	2.250	2.294	- .044
	All	2.312	2.262	+ .050
		Size 80 compared with 96		Difference
	Early	2.283	2.109	[2] + .174
	Mid	2.110	2.005	[2] + .105
	Late	2.196	2.173	+ .023
	All	2.192	2.082	[2] + .110
		Size 150 compared with size 176		Difference
Valencia oranges	All	2.661	2.816	[2] - .155
		Size 176 compared with size 200		Difference
	All	2.868	2.882	- .014
		Size 200 compared with size 216		Difference
	All	2.859	2.885	- .026

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[1] Differences in average net returns for a given variable are caused by differences in lots of fruit that could be matched in each comparison. See appendix pages 56-59 for further explanation.

[2] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

Net returns for different sizes of Valencia oranges sold at auction showed large fruit discounted over small fruit. Size 150 fruit was discounted an average of 17.1 cents over size 176. This in turn was discounted an average of 17.8 cents over size 200 and this was discounted 5.2 cents over size 216. Net return differences between larger sizes, 150-176 and 176-200, were statistically significant.

Size comparisons for sales made through brokers or directly to buyers by Interior shippers, table 20, present a different net return picture than the size comparisons for auction sales. Average differences were smaller for all sizes compared except sizes 80 and 96 white seedless grapefruit. On an all season basis only one comparison for each fruit, sizes 80 and 96 white seedless grapefruit and sizes 150 and 176 Valencia oranges, showed results to be statistically significant. Larger early season net return differences for comparisons of sizes 70-80 and 80-96 white seedless grapefruit sold by broker and direct methods are similar to seasonal patterns established for auction sales.

In contrast to size comparisons for auction sales, size comparisons for broker and direct sales of small size, 80 and 96, white seedless grapefruit showed larger net return differences and statistically significant results. Comparison of larger size fruit, 64-70 and 70-80, sold through brokers and by direct sale showed smaller net return differences than for auction sales and were not statistically significant. Except for the 176-200 size comparison for Valencia oranges, which showed a small and not statistically significant net return difference, broker and direct sales size comparisons were similar to auction sale size comparisons.

Net return comparisons by size of fruit for 13 Indian River packinghouses shipping white seedless grapefruit and Valencia oranges are shown in table 21. This table includes data for auction, broker and direct sales.

Net return comparisons for different sizes of white seedless grapefruit and Valencia oranges shipped by Indian River area packinghouses were similar to comparisons for the Interior houses (table 21). For white seedless grapefruit these differences were larger. For Valencia oranges the size 200-216 comparison showed the smaller size 216 fruit discounted while it was considered the premium size in the Interior area.

Differences in the results of comparisons for Indian River and Interior packinghouses may have some basis in the fact that auction sales are the predominant outlet for Indian River fruit, while Interior fruit is more commonly sold by non-auction methods.

All comparisons for white seedless grapefruit showed statistical significance. Size 64 fruit showed an average premium for the season of 38.6 cents per box over size 70 fruit. Size 70 fruit showed a 39.5 cent premium over size 80 fruit and this in turn showed an 18.9 cent premium over size 96 fruit.

Size 200 Valencias shipped from the Indian River area showed an average return of 8.5 cents per box more than 176's and 8.9 cents more than 216's. Size 176 Valencias showed an average return of 11.3 cents more than 150's.

Table 22 shows these same net return comparisons for Indian River auction sales. Net return differences for these sales showed little departure from the pattern for all sales with the exception of the comparisons of sizes 64 and 70 white seedless grapefruit for the last 4 sample weeks where the average net return difference practically disappeared. But in general, differences in returns by size of fruit, particularly for Valencia oranges, were greater when auction sales were considered alone.

Size comparisons for broker and direct sales by Indian River shippers are tabulated in table 23. Results indicated smaller net return differences which were, with one exception, not statistically significant. In general, these findings reflected the large

TABLE 21.--Comparison between net returns for selected fruit sizes, Florida Indian River white seedless grapefruit and Valencia oranges sold through brokers, direct, and at auction to all types of buyers. (U. S. No. 1 Golden and Bronze fruit, packed in 1-3/5 nailed boxes, 13 packinghouses, 1953-54 season)

Type of fruit	Marketing period	Average net return[1]		
		Dollars per box		
		Size 64 compared with size 70		Difference
White seedless grapefruit	Early	4.284	3.671	[2] +0.613
	Mid	3.456	3.106	[2] + .350
	Late	3.219	3.042	[2] + .177
	All	3.661	3.275	[2] + .386
		Size 70 compared with size 80		Difference
	Early	3.667	2.933	[2] + .734
	Mid	3.100	2.799	[2] + .301
	Late	3.037	2.899	[2] + .138
	All	3.267	2.872	[2] + .395
		Size 80 compared with size 96		Difference
	Early	2.950	2.754	[2] + .196
	Mid	2.772	2.687	[2] + .085
	Late	2.893	2.568	[2] + .325
	All	2.864	2.675	[2] + .189
		Size 150 compared with size 176		Difference
Valencia oranges	All	3.244	3.357	[2] - .113
		Size 176 compared with size 200		Difference
	All	3.421	3.506	[2] - .085
		Size 200 compared with size 216		Difference
	All	3.502	3.413	[2] + .089

[1] Differences in average net returns for a given variable are caused by differences in lots of fruit that could be matched in each comparison. See appendix pages 56-59 for further explanation.

[2] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

proportion of sales which were made without a price difference and the smaller proportion of all sales made by these methods.

In these comparisons of net returns by size of fruit, the responsiveness of the auction method of sale to physical fruit characteristics becomes apparent. Table 24 summarizes average season net return differences per box for all major sales methods as compared with auction sales and with broker and direct sales. Differences were larger for auction sales as compared with broker and direct sales in 10 out of 12 cases and in many cases were substantially larger.

TABLE 22.--Comparison between net returns for selected fruit sizes, Florida Indian River white seedless grapefruit and Valencia oranges sold at auction to all types of buyers (U.S. No. 1 Golden and Bronze fruit, packed in 1-3/5 nailed boxes, 13 packinghouses, 1953-54 season)

Type of fruit	Marketing period	Average net return[1]		
		Dollars per box		
		Size 64 compared with size 70		Difference
White seedless grapefruit	Early	4.483	3.704	[2] +0.779
	Mid	3.408	3.043	[2] + .365
	Late	3.030	3.035	- .005
	All	3.666	3.264	[2] + .402
		Size 70 compared with size 80		Difference
	Early	3.704	2.842	[2] + .862
	Mid	3.043	2.743	[2] + .300
	Late	3.034	2.885	[2] + .149
	All	3.264	2.816	[2] + .448
		Size 80 compared with size 96		Difference
	Early	2.843	2.668	[2] + .175
	Mid	2.746	2.700	[2] + .046
	Late	2.864	2.464	[2] + .400
	All	2.811	2.624	[2] + .187
		Size 150 compared with size 176		Difference
Valencia oranges	All	3.242	3.369	[2] - .127
		Size 176 compared with size 200		Difference
	All	3.369	3.497	[2] - .128
		Size 200 compared with size 216		Difference
	All	3.497	3.375	[2] + .122

[1] Differences in average net returns for a given variable are caused by difference in lots of fruit that could be matched in each comparison. See appendix page 56-59 for further explanation.

[2] Statistically significant - for explanation see page 22-24 of text or for more technical detail see pages 56-59 of appendix.

Grade

Citrus shipped from Florida is graded to U. S. standards. These grades are based on quality and appearance of fruit and are recognized as factors affecting price. Fruit shipped from the Interior area is primarily U. S. No. 1 grade with some grapefruit having been shipped in the 1953-54 season as U. S. No. 2 fruit. In the Indian River area two grades accounted for the bulk of all shipments, U. S. No. 1 Golden and U. S. No. 1 Bronze. Other grades accounted for only a minor portion of shipments in the season sampled.

TABLE 23.--Comparison between net returns for selected fruit sizes, Florida Indian River, white seedless grapefruit and Valencia oranges sold through brokers and direct to all types of buyers (U. S. No. 1 Golden and Bronze fruit, packed in 1-3/5 nailed boxes, 13 packinghouses, 1953-54 season)

Type of fruit	Marketing period	Average net return[1]		
		Dollars per box		
		Size 64 compared with size 70		Difference
White seedless grapefruit	Early	3.633	3.563	+0.070
	Mid	3.628	3.330	+ .298
	Late	3.677	3.061	[2] + .616
	All	3.647	3.309	+ .338
		Size 70 compared with size 80		Difference
	Early	3.537	3.257	+ .280
	Mid	3.292	2.985	+ .307
	Late	3.044	2.935	+ .109
	All	3.279	3.049	+ .230
		Size 80 compared with size 96		Difference
	Early	3.272	3.014	+ .258
	Mid	2.835	2.652	+ .183
	Late	2.961	2.814	+ .147
	All	3.002	2.808	+ .194
		Size 150 compared with size 176		Difference
Valencia oranges	All	3.251	3.302	- .051
		Size 176 compared with size 200		Difference
	All	3.549	3.528	+ .021
		Size 200 compared with size 216		Difference
	All	3.513	3.503	+ .010

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[1] Differences in average net returns for a given variable are caused by differences in lots of fruit that could be matched in each comparison. See appendix pages 56-59 for further explanation.

[2] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

No net return comparisons by grade were possible for the Interior area because grades other than U. S. No. 1 were shipped so infrequently that data were not available. However, in the Indian River area, U. S. No. 1 Golden and U. S. No. 1 Bronze grades were shipped in sufficient volume to form a basis for comparison. Table 25 shows the results of net return comparisons by grade for white seedless grapefruit and Valencia oranges. Comparisons are shown for all major sales methods, for auction sales and for broker and direct sales.

TABLE 24.--Average seasonal net return differences per 1-3/5 bushel box, selected sizes, U. S. No. 1 grades, all methods of sale[1] as compared with auction sales only, and with broker and direct sales, 1953-54 season

Area	Type of fruit	Sizes compared	All sales	Auction sales only	Broker and direct sales
			Dollars	*Dollars*	*Dollars*
Interior	White seedless grapefruit	64 with 70	+0.050	[2] +0.206	+0.029
		70 with 80	+ .056	[2] + .089	+ .050
		80 with 96	[2] + .106	+ .063	[2] + .110
	Valencia Oranges	150 with 176	[2] - .158	[2] - .171	[2] - .155
		176 with 200	- .040	[2] - .178	- .014
		200 with 216	- .030	[2] - .052	- .026
Indian River	White seedless grapefruit	64 with 70	[2] + .386	[2] + .402	+ .338
		70 with 80	[2] + .395	[2] + .448	+ .230
		80 with 96	[2] + .189	[2] + .187	+ .194
	Valencia oranges	150 with 176	[2] - .113	[2] - .127	- .051
		176 with 200	[2] - .185	[2] - .128	+ .021
		200 with 216	[2] + .089	[2] + .122	+ .010

[1] All methods of sale includes auction, broker and direct.

[2] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

Differences in net returns always indicated that fruit graded Golden brought higher net returns except for broker and direct sales of Valencia oranges. These differences were substantial, averaging 13 cents per box or more for white seedless grapefruit and over 35 cents per box for Valencia oranges except as noted. All net return comparisons by grade involving auction and all sales showed results which were statistically significant.

TABLE 25.--Comparison between net returns for different grades, Florida Indian River white seedless grapefruit and Valencia oranges (selected sizes packed in 1-3/5 bushel nailed boxes, 13 packinghouses, 1953-54 season)

Type of fruit	Method of sale	Average net return U. S. No. 1 Grades		
		Dollars per box		
		Golden	compared with Bronze	Difference
White seedless grapefruit	Auction	3.206	2.989	[1] +0.217
	Broker and direct	3.220	3.084	+ .136
	All[2]	3.210	3.013	[1] + .197
Valencia oranges	Auction	3.582	3.125	[1] + .457
	Broker and direct	3.442	3.472	- .030
	All[2]	3.552	3.200	[1] + .352

[1] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

[2] All includes auction, broker and direct sales.

Net return differences for Golden fruit were greater when auction sales were considered separately from other major sales methods. This leads to the same conclusion reached in comparing returns by size of fruit, that auction sales were more responsive to differences in physical characteristics of fruit than were the other leading sales methods.

Type of Buyer

The assumption that sales made to some types of buyers should bring higher returns than sales made to other types of buyers would seem reasonable. For instance, with the buying power and control over large numbers of retail outlets held by chain stores, it would appear that the bargaining position would be strong enough to affect returns to shippers as compared with other types of buyers not having what would seem to be these advantages.

The relationship between type of buyer and net returns was examined in this study for Interior area shippers. Shipments to the non-auction segments of the fresh fruit trade from the Indian River area were not in sufficient volume at the time of this study to provide a basis for net return comparisons by type of buyer. Available records on auction sales in this area did not provide information on type of buyer.

Net return comparisons are summarized in table 26 for three types of buyers of Interior area white seedless grapefruit and Valencia oranges. Results give little indication that type of buyer is an important factor influencing returns. Only in comparisons of net returns for wholesalers with those of chains did results show any statistical significance.

In those comparisons net return differences showed chain sales returning an average of 1.7 cents a box more for white seedless grapefruit sales when broker and direct sales methods were considered together, 2.6 cents per box more for Valencia orange sales made by these same sale methods, and 5.3 cents per box more for Valencia orange sales made directly to the buyer. Sales to other types of buyers showed higher returns than sales made to either wholesalers or chains but comparisons lacked statistical significance.

Net return differences associated with type of buyer were greater for direct sales than for broker sales. This observation is based for the most part on results which show no statistical significance but these data suggest that in the case of direct sales, pricing techniques allowed greater differentials to some buyers than to others.

In general type of buyer had only a small effect on net returns to shippers. Net return comparisons showed either very small differences or differences which lacked statistical significance. However, the volume requirements of some buyers might make even these small differences in average returns per box an important consideration over the long-run period.

Method of Sale

The assumption that a particular method of sale will influence net returns to shippers has some logical basis. Certain costs are incurred when fruit is sold by one method that are not incurred when the sale is made by other methods. For example, sales made through brokers involve the performance of services for which there is an assessment of a brokerage cost, usually small. Such a cost is not incurred by the seller if the sale is made directly to the buyer. Sales made at terminal auctions require various services for which the seller pays the cost. These include the various transportation and cartage

TABLE 26.--Comparison between net returns for different types of buyers, Florida Interior white seedless grapefruit and Valencia oranges (U. S. No. 1 fruit, selected sizes packed in 1-3/5 bushel wirebound boxes, 23 packinghouses, 1953-54 season)

Type of fruit	Method of sale	Average net return[1]		
		Dollars per box		
		Wholesalers compared with chains		Difference
White seedless grapefruit	Broker	2.161	2.137	+0.024
	Direct	2.214	2.279	- .065
	Broker and direct	2.186	2.203	[2] - .017
Valencia oranges	Broker	2.747	2.755	- .008
	Direct	2.742	2.795	[2] - .053
	Broker and direct	2.745	2.771	[2] - .026
		Other buyers[3] compared with wholesalers		Difference
White seedless grapefruit	Broker	2.193	2.192	+ .001
	Direct	2.299	2.247	+ .052
	Broker and direct	2.211	2.201	+ .010
Valencia oranges	Broker	2.735	2.722	+ .013
	Direct	2.816	2.751	+ .065
	Broker and direct	2.751	2.728	+ .023
		Other buyers[3] compared with chains		Difference
White seedless grapefruit	Broker	2.132	2.149	- .017
	Direct	2.364	2.254	+ .110
	Broker and direct	2.260	2.207	+ .053
Valencia oranges	Broker	2.671	2.613	+ .058
	Direct	3.033	2.938	+ .095
	Broker and direct	2.834	2.759	+ .075

[1] Differences in average net returns for a given variable are caused by differences in lots of fruit that could be matched in each comparison. See appendix pages 56-59 for further explanation.

[2] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

[3] Other buyers include: local buyers at packinghouses, Government and Quartermaster Corps, pool buyers, other plants and others not identified.

charges as well as the actual auction commissions. It should be noted that recovery of auction sale charges is not assured or predetermined as with other methods of sale.

The net return comparisons shown in the following tables should be considered carefully for the differences indicated, to some extent, reflect the costs of the different types of services involved in different sales methods.

In the previous section, type of buyer was found to have only a very small influence on net returns, but results indicated that there was some association between these net return differences by type of buyer and the method of sale involved. As a result net

Export sales constitute a small but important part of the total sales.

returns for various methods of sale were first compared with full consideration given to type of buyer. Actually only two methods of sale, direct and broker, could be compared under these circumstances since available sales records did not give any information about buyers of fruit sold at auction. Also the auction method of sale was so predominant in Indian River sales that no comparison by type of buyer was possible for that area.

Table 27 shows the net return comparisons for direct and broker sales by type of buyer. The pattern is the same for white seedless grapefruit and Valencia oranges. Direct sales produced higher average returns per box in all cases but substantially higher returns for sales made to chains and other types of buyers. These differences for white seedless grapefruit averaged 17.9 cents per box more for direct sales to all types of buyers as compared with 11 cents for sales to chains, 3.6 cents for sales to wholesalers, and 15.2 cents for sales to other types of buyers.

For Valencia oranges these net return differences showed direct sales averaging 4.8 cents more than broker sales to all types of buyers as compared with 7.9 cents for sales to chains, 1.9 cents for sales to wholesalers and 6.8 cents for sales to other types of buyers. All of these differences are statistically significant except the 6.8 cents difference for Valencia orange sales to wholesalers.

Chain buyers and other types of buyers are probably in a better position to use the direct method of sale than are wholesale buyers, either because of volume purchased or because of location. This is particularly true in the case of local buyers or other plants that are included in the other type of buyer category. This may be a part of the explanation of why greater net return differences are indicated for direct and broker sales when chain and other types of buyers are considered.

These comparisons of net returns to Interior shippers for different methods of sale can now be considered without regard to type of buyer. This means that cross comparison of data has excluded any direct consideration of the effect that a particular type of buyer might have on returns. Disregard for type of buyer is not meant to imply that all buyers used different sales methods to the same extent. We know that some types of buyers used the direct method much more than they used brokers and we have reason to believe that

TABLE 27.--Comparison between net returns for direct and broker methods of sale, by type of buyer, Florida Interior white seedless grapefruit and Valencia oranges (U. S. No. 1 fruit, selected sizes, packed in 1-3/5 bushel wirebound boxes, 23 packinghouses, 1953-54 season)

Type of fruit	Type of buyer	Average net return		
		Dollars per box		
		Direct compared with broker		Difference
White seedless grapefruit	Chain	2.263	2.153	[1] +0.110
	Wholesaler	2.168	2.132	[1] +.036
	Other[2]	2.411	2.259	[1] +.152
	All	2.248	2.169	[1] +.179
Valencia oranges	Chain	2.583	2.503	[1] +.079
	Wholesaler	2.785	2.766	[1] +.019
	Other[2]	2.714	2.646	+.068
	All	2.703	2.655	[1] +.048

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[1] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

[2] Other buyers include: Local buyers at packinghouse, Government and Quartermaster Corps, pool buyers, other plants and others not identified.

TABLE 28.--Comparison between net returns for different methods of sale, regardless of type of buyer, Florida Interior white seedless grapefruit and Valencia oranges (U. S. No. 1 fruit, selected sizes, packed in 1-3/5 bushel wirebound boxes, 23 packinghouses, 1953-54 season)

Type of fruit	Average net return[1]		
	Dollars per box		
	Auction compared with broker		Difference
White seedless grapefruit	1.854	2.246	[2] -0.392
Valencia oranges	2.867	2.937	[2] -.070
	Auction compared with direct		Difference
White seedless grapefruit	1.809	2.372	[2] -.563
Valencia oranges	2.836	2.937	[2] -.101
	Direct compared with broker		Difference
White seedless grapefruit	2.256	2.169	[2] +.087
Valencia oranges	2.893	2.846	[2] +.047

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[1] Differences in average net returns for a given variable are caused by differences in lots of fruit that could be matched in each comparison. See appendix pages 56-59 for further explanation.

[2] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

these same buyers used auction sales to only a very limited extent. However, from the shipper's or seller's point of view, one method of sale might well be compared with another without regard to type of buyer.

Net return comparisons for the different sales methods used by Interior shippers excluding consideration of type of buyer are shown in table 28. Direct sales showed higher returns per box than broker sales, 8.7 cents more for white seedless grapefruit and 4.7 cents more for Valencia oranges. Direct sales also showed higher returns per box than auction sales by 56.3 cents for white seedless grapefruit and 10.1 cents for Valencia oranges. Broker sales similarly gave higher returns per box than auction sales, 39.2 cents more for white seedless grapefruit and 7 cents more for Valencia oranges. All of these results were statistically significant.

Comparisons involving Interior area auction shipments may not necessarily reflect a complete picture of the terminal auction market's potential. Two conditions prevailed which affected these data. One was that Interior shippers as a group did not use the terminal auction markets for any large proportion of their fruit. Auction sales were not as important to this area of the State as were other methods of sale. The other condition was one which involved a continuing tendency on the part of some shippers to use auction markets as either a desirable outlet for quality fruit or for fruit for which no other buyer can be found. Data collected for this study indicated both types of sales.

The impact of a planned auction sales program can be detected in sales data collected from Interior area shippers. Average net returns to houses shipping high and low proportions of their total fruit to auction markets are compared in table 29. When shipments to auction accounted for 84 percent or more of white seedless grapefruit volume and 60 percent or more of Valencia orange volume of the individual houses, it was assumed that some kind of auction sales program had been developed.

TABLE 29.--Average net returns for auction shipments of Florida Interior white seedless grapefruit and Valencia oranges based on proportion of shippers' total sales made in terminal auction markets. (U. S. No. 1 fruit, packed in 1-3/5 bushel wirebound boxes, 23 packinghouses, 1953-54 season).

Type and size of fruit	Houses selling a high proportion of fruit at auction[1]	Houses selling a low proportion of fruit at auction[2]	Difference between high and low
White seedless grapefruit	Dollars	Dollars	Dollars
64	2.265	1.768	+0.497
70	2.083	1.680	+.403
80	2.077	1.774	+.303
96	2.002	1.930	+.072
Valencia oranges			
150	2.762	2.414	+.348
176	2.921	2.601	+.320
200	3.115	2.893	+.222
216	3.296	2.790	+.506

[1] High proportion in the case of white seedless grapefruit represents 84 to 100 percent of total sales and 60 to 82 percent of total sales for Valencia oranges

[2] Low proportion in the case of white seedless grapefruit represents 19 percent or less of total sales for Valencia oranges.

For all other Interior houses, auction shipments accounted for 19 percent or less of their white seedless grapefruit volume and 15 percent or less of their Valencia orange volume and it was assumed that this was evidence of no well developed auction market program.

Comparison of net returns of these two groups of Interior shippers showed that houses with a strong auction program received from 7 to 50 cents more a box for auction sales of white seedless grapefruit and from 22 to 51 cents more a box for Valencia oranges than houses showing no evidence of strong auction programs.

Although data were limited, there was further evidence that auction sales compared favorably with other methods of selling when net returns were compared for that group of Interior houses showing evidence of a strong auction program. In contrast houses selling only a small proportion of their fruit at auction showed returns for this method of sale to be less favorable than for other methods.

All shippers sampled in the Indian River area sent 41 percent or more of their white seedless grapefruit and Valencia oranges to terminal auction markets. There was no pattern of fruit movement which clearly indicated a marked difference in auction sale programs as there was for Interior shippers. Examination of the data showed no consistent difference in white seedless grapefruit returns for Indian River houses on a basis of proportion of total sales made in terminal auctions.

Method of sale data by type of buyer were somewhat limited for Indian River shipments. However, there were enough data to permit comparisons of methods of sale, provided type of buyer is disregarded. This gave an opportunity to make method of sale comparisons in an area where auctions were seldom used to move distressed fruit. These comparisons showed auction selling had a status in the Indian River area not generally attained in the other production areas of Florida.

Net returns for Indian River white seedless grapefruit sold by various sales methods are compared in table 30. Data for Valencia oranges were so limited that comparisons for this variable were not attempted. Results are shown here by time periods to indicate a seasonal pattern in net return differences. Although data were limited for the Indian River area, white seedless grapefruit showed a general pattern similar to the one shown for Interior fruit.

For the season, broker sales averaged 9.7 cents a box more than auction sales but the results lacked statistical significance. If these comparisons are considered by 4-week periods, the early period showed auction sales returning 9.7 cents more than broker sales, the mid period showed the reverse or broker sales with 13.1 cents more than auction sales, and the late period showed broker sales returning 26.3 cents more than auction sales. However, the comparison for the late marketing period was the only one that was statistically significant.

The comparison of auction and direct sales showed direct sales averaging 17.7 cents a box more for the season. For the early marketing period, direct sales showed only 0.7 cents higher returns, 36.4 cents more in the mid period and 25.2 cents more in the late period. The 36.4 cents difference in the mid marketing period and the 17.7 cents season difference were statistically significant.

These two comparisons involving auction sales give some reason for the contention that early season sales of white seedless grapefruit in the terminal auction markets give the shipper returns averaging as high as returns from other methods of sale. As the season progressed, this did not hold and auction sales showed a price disadvantage on a shipping point basis as compared with other methods.

When direct and broker sales were compared, there was no marked seasonal pattern in net return differences. With the exception of the mid marketing period, direct

TABLE 30.--Comparison between net returns for different methods of sale, regardless of type of buyer, Florida Indian River white seedless grapefruit (U. S. No. 1 Golden and Bronze fruit, selected sizes, packed in 1-3/5 bushel nailed boxes, 13 packinghouses, 1953-54 season)

Type of fruit	Marketing period	Average net return[1]		
		Dollars per box		
		Auction compared with broker		Difference
White seedless grapefruit	Early	3.490	3.393	+0.097
	Mid	2.955	3.086	-.131
	Late	2.769	3.032	[2] -.263
	All	3.070	3.167	-.097
		Auction compared with direct		Difference
	Early	3.165	3.172	-.007
	Mid	2.864	3.228	[2] -.364
	Late	2.991	3.243	-.252
	All	3.035	3.212	[2] -.177
		Direct compared with broker		Difference
	Early	3.607	3.507	+.100
	Mid	3.217	3.149	+.068
	Late	3.185	3.082	[2] +.103
	All	3.216	3.117	[2] +.099

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[1] Differences in average net returns for a given variable are caused by differences in lots of fruit that could be matched in each comparison. See appendix pages 56-59 for further explanation.

[2] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

sales averaged 10 cents more a box than broker sales. As indicated the difference in this period was 6.8 cents. Results in both the early and mid marketing periods lacked significance.

Method of sale definitely influences net returns to shippers. The difference in net returns indicated in the foregoing discussion represents, to some extent, differences in services performed. Where auction sales are compared with other sales methods, net return differences may also reflect the dual role of this market--an outlet for superior quality fruit or for ordinary to poor offerings. These extremes tend to accentuate each other and help to produce price disturbances.

Viewing the net return differences which occur when fruit is sold by different methods, there is the temptation to think that the best sales method is the one which gives best returns. This is not necessarily so. In the case of direct selling for instance, the shipper does not follow his product through the marketing channels. Title to the product changes at shipping point as a usual matter and the shipper's services are ended.

Direct sales may cut costs to some extent, but the shipper becomes a supplier or an assembler or a packager of the product. Such a shipper is probably not doing much in the merchandising or advertising fields and is losing a measure of control over his product. This is in sharp contrast with the well integrated marketing system where shippers at the production level are attempting to maintain some control over their products through the marketing channels, thereby maintaining and increasing opportunities for better returns.

Type of Sales Organization

Shippers or packinghouses were grouped in this study according to type of sales organization through which fruit was sold. Florida has one federated sales organization which acts as sales agent for a group of shipper members. This federated sales organization handled 20 percent of Florida's 1953-54 certified shipments. In this study this type of organization is compared with individual packinghouse sales departments and independent shippers that sell for a few other houses.

Net return comparisons by type of sales organization followed the pattern used in all other net return comparisons. Lots of fruit were matched with consideration for such factors as type of container, size of fruit, grade, area of production and time period, but obviously it was impossible to match lots of fruit within packinghouses. Consideration was given to the role that volume of shipments might play in influencing net returns.

It was assumed that one of the basic reasons for joining and operating a federated sales agency was to gain the benefits of volume selling, although each individual shipper member might handle only a relatively small volume. Hence, volume strata were not considered in these comparisons. However, the sample of packinghouses was selected with consideration for volumes shipped and both federated and nonfederated sales have houses in the various volume classifications.

Also, sales methods and types of buyers were not included among the factors to be considered in matching lots of fruit for sales organization comparisons. The reasoning here was that the sales organizations were free to sell by whatever methods would bring best returns over the long-run period.

With the net return comparisons by type of sales organization, we considered carefully the physical variations in quality of fruit, but those factors which demand management decision were not specifically considered. By its very nature, a comparison of net returns for different types of sales organizations covers all of these things, for it is a comparison which reflects different management practices and decisions.

In the following net return comparisons by type of sales organization, a two-tailed test was used to determine statistical significance as compared with a one-tailed test used for all other comparisons shown in this report. The use of these tests is explained in the appendix, page 59, but in general, use of the two-tailed test doubles requirements for significance. This departure was made because prior to the study no economic data

The sales department is in constant contact with buyers to determine prices and negotiate sales.

were available indicating the direction of net return differences by type of sales organization, if in fact, such a difference did occur. Under these conditions the two-tailed test was more appropriate than a one-tailed test.

Table 31 shows net return comparisons by type of sales organization for white seedless grapefruit and Valencia oranges shipped from Interior and Indian River houses. Average net returns per box for white seedless grapefruit were very little different when sold by federated houses as compared with nonfederated houses. Returns for Interior packinghouses were 0.2 cent a box higher for federated sales. In the Indian River area, returns were 0.5 cent a box higher for nonfederated sales. In both cases results were not statistically significant.

TABLE 31.--Comparison between net returns for federated and nonfederated sales organizations, Florida white seedless grapefruit and Valencia oranges (U. S. No. 1 grades, selected sizes, packed in 1-3/5 bushel boxes, 23 Interior and 13 Indian River packinghouses, 1953-54 season)

Area	Type of fruit	Average net return		
		Dollars per box		
		Federated compared with nonfederated		Difference
Interior	White seedless grapefruit	2.202	2.200	+0.002
	Valencia oranges	2.899	2.867	[1] +.032
	Valencia oranges[2]	2.899	2.848	[1] +.051
Indian River	White seedless grapefruit	3.099	3.104	-.005
	Valencia oranges	2.202	2.200	+.002

[1] Statistically significant - for explanation see pages 22-24 of text or for more technical detail see pages 56-59 of appendix.

[2] This comparison is the same as the one above, except that two packinghouses selling predominantly natural color fruit are excluded. See appendix pages 56-59 for further explanation.

Similarly, average net returns for Valencia oranges shipped by sample Indian River houses showed a slightly higher, 0.2 cent, return per box for federated sales. This also was not statistically significant. Among Interior houses, returns for Valencia oranges averaged 3.2 cents more for federated sales than for nonfederated sales. This result was statistically significant but it included data from two packinghouses that were heavy natural color[1] shippers.

In the appendix, page 55, the problem of price differentials for color-add versus natural color fruit is discussed. Data on color-add Valencias were not tabulated separately. An attempt was made in analyzing this material to examine these data with the three heavy natural color shippers in the Interior area eliminated from the tabulations. This put the proportion of color-add fruit handled by federated and nonfederated houses at more comparable levels.

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[1] Natural color fruit is the term applied to fruit not artificially colored. The opposite situation where coloring material has been added is referred to in the trade as color-add fruit.

The second or footnoted entry for Interior Valencia oranges shown in table 31 is the comparison from which the data from two heavy natural color nonfederated houses have been eliminated. The average net return is higher for federated sales than for nonfederated sales by 5.1 cents per box. This result is statistically significant and compares with a 3.2 cent per box difference with the heavy natural color shippers included.

Results of net return comparisons by type of sales organization showed some evidence that federated selling was able to make better returns than nonfederated sales for Valencia oranges and usually as good returns for white seedless grapefruit.

Summary

Net return comparisons made in this study fall into two classes--those concerned with physical differences in fruit, such as size or grade of fruit, and those concerned with differences which result from managerial decisions, such as method of sale, type of buyer, and type of sales organization.

In the first class, net return comparisons for different sizes of fruit showed small white seedless grapefruit sizes and large Valencia orange sizes to be discounted most heavily. Comparisons of returns for different grades of fruit were limited to the Indian River area, but indicated that U. S. No. 1 Golden fruit brought better returns than U. S. No. 1 Bronze. Auction sales showed more response to these physical characteristics than did other methods of sale.

In the second class of comparisons, those concerned with factors demanding managerial decision, type of buyer showed only a small influence on returns. Chain buyers showed an advantage in net returns when compared with wholesalers but other comparisons did not show statistically significant differences.

Net return comparisons for different methods of sale showed highest returns occurring for direct sales with broker and auction sales next. However, net return differences reflect services performed. Comparisons involving auction sales have probably been affected by the tendency on the part of some shippers to use this outlet for high quality fruit while others use it for distressed fruit. Smaller returns for broker sales as compared with direct sales indicate differences which approximate the cost of broker services.

When sales personnel were interviewed, they occasionally indicated that diversified outlets were desirable but this is not borne out in net return comparisons. Net return comparisons by type of buyer showed that there was a slight advantage to the shipper for those sales made to chain buyers, particularly when direct sales were made. This tied in with the net return advantage shown for direct sales over other types of selling for it was in the direct sale that chain buyers played a dominant role. However, returns per box may not be the only standard by which to judge the value of a particular type of buyer or method of sale.

The opportunity to develop a well integrated marketing system or the consideration for repeat or volume sales may influence gross returns or organizational growth to an extent far outweighing slightly smaller returns per box.

Diversification of markets was not conclusively shown to be either desirable or undesirable. However, it would appear that other factors, such as the specific buyer, were more important than wide market distribution, partly because certain buyers, by virtue of their nationwide or area coverage, represented the demands and choices of consumers in many areas.

Type of sales organization was shown to have little effect on net returns for white seedless grapefruit. However, higher returns were shown for federated sales of Valencia oranges, especially when the proportion of color-add fruit was about equal for both federated and nonfederated houses.

DISTRIBUTION OF FRESH CITRUS SHIPMENTS

Fresh citrus shipments for the 38 packinghouses included in this study are summarized in the tables that follow by types of fruit for size, grade, containers, method of sale, terms of sale, type of buyer, market location and time.

These 38 packinghouses represented a sizeable sample of all Florida fresh citrus shippers in the 1953-54 season. Sampling of packinghouses and further sampling of sales records may have produced some sample error. The practices among individual houses included in the sample showed much variation indicating that houses not included in the sample could be expected to have selling practices quite different from those indicated here. In general, these data describe broad industry practices except where volume is small or variables are of minor importance.

A supplemental report will be available providing in detail these same data for important varieties of fruit by production area and by type of sales organization within each production area. In addition there will be some tabulations by type of fruit showing the cross relationship of two variables such as method of sale and type of buyer.

Only a brief discussion of the highlights of these tables is presented here and this is limited to general relationships and trends. Specific detail can be had by reference to the supplemental report.

Total boxes as shown in these tables represented shipments for the 12 sample weeks with data adjusted for varying sample rates. Distribution of the shipments for the variables is shown as the percent of total boxes for the sample period. The number of boxes shown in these tables averaged more than two carlots for all fruit shown, except Indian River tangelos. The small amount of this fruit shipped from that area did not provide any real basis for analysis.

Size of Fruit

Table 32 shows the distribution of shipments by size of fruit. Oranges showed considerable variation between areas in the percent shipped of any particular size. In the North Florida and Interior areas sizes 176 and 216 accounted for larger volumes than other sizes. In the Indian River area size 176 accounted for 24 percent or the largest volume of any size with sizes 200, 216, and 250 following closely and ranging from 18 to 19 percent each.

Miscellaneous sizes other than the five shown ranged from as little as 6 percent of all Indian River shipments to as much as 21 percent of all North Florida shipments. In part this high miscellaneous volume is due to one large shipper's use of an experimental container which produced an odd sizing situation.

Grapefruit sizes 70, 80, and 96 accounted for 76 percent of the fruit shipped from the North Florida area, 62 percent of Interior shipments, and 73 percent of Indian River shipments. Size 54 showed the smallest volume of any of the five grapefruit sizes with other miscellaneous sizes ranging from 3 percent for the Indian River area to 7 percent in the Interior area. This concentration of shipments into five major sizes is much more marked for grapefruit than for oranges.

Tangerines fell mainly into three sizes: 120, 150, and 176. Shipments from Interior and Indian River houses showed similar size distributions running to larger size fruit as compared with shipments from North Florida houses. Miscellaneous sizes varied from 7 percent of North Florida shipments to 13 percent of Indian River shipments.

Mandarin oranges showed much variation in size which is responsible for the larger miscellaneous or other classification. This is due to the use of at least three different

TABLE 32.--Percentage distribution of fresh citrus shipments by size of fruit and production area for 38 Florida packinghouses, 12 sample weeks, 1953-54 season

Production area	Total boxes[1]	Percent shipped by size						
				Oranges[2]				
	1,000 boxes	150	176	200	216	250	All others[3]	Total
North Florida	890	11.4	18.7	14.6	21.4	13.2	20.7	100.0
Interior	943	19.8	24.4	12.3	22.4	11.7	9.4	100.0
Indian River	337	13.6	24.0	18.0	18.8	19.3	6.3	100.0
				Grapefruit				
		54	64	70	80	96	All others[3]	Total
North Florida	398	7.8	13.0	22.5	26.3	27.0	3.4	100.0
Interior	958	12.9	17.8	22.2	22.4	17.5	7.2	100.0
Indian River	940	9.1	14.5	18.3	33.2	21.8	3.1	100.0
				Tangerines				
		120		150		176	All others[3]	Total
North Florida	94	23.9		35.9		33.3	6.9	100.0
Interior	83	32.3		35.5		22.3	9.9	100.0
Indian River	9	32.9		31.4		22.8	12.9	100.0
				Mandarin oranges[4]				
		66		80		90	All others[3]	Total
North Florida	101	23.3		27.2		15.6	33.9	100.0
Interior	37	19.8		23.5		1.2	55.5	100.0
Indian River	59	.6		.6		20.7	78.1	100.0
				Tangelos				
		66	80	100		130	All others[3]	Total
North Florida	25	19.9	25.2	29.3		10.9	14.7	100.0
Interior	1	34.8	21.2	6.4		.8	36.8	100.0
Indian River	([5])						100.0	100.0

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[1] Adjusted for varying sample rates.

[2] Not including mandarin oranges.

[3] All others include sizes between, sizes larger and sizes smaller than those sizes indicated. Intermediate sizes, especially of oranges in the North Florida area, all mandarin oranges and tangerines were associated at least in part with experimental packs or with a variety of containers each allowing a different sizing system.

[4] Includes Temple and King oranges only.

[5] Less than 500 boxes.

containers, each requiring different sizing. Of the 38 houses considered, North Florida shippers had the largest volume of mandarins, two-thirds of which was shipped as sizes 66, 80, and 90.

Tangelo shipments sampled came primarily from North Florida houses. Sizes 66, 80, 100, and 130 accounted for the major part of all shipments with 80 and 100 most important in the North Florida area.

Method of Sale

Table 33 shows the distribution of shipments by three major methods of sale. Auction, broker, and direct sales accounted for 90 percent or more of all shipments except Interior oranges and mandarin oranges and these accounted for 89 percent or more. During the 1953-54 season the auction sale was most important volumewise for Indian River shippers for all types of fruit except tangelos. For oranges, grapefruit and tangerines, broker sales by North Florida shippers and direct sales by Interior shippers accounted for the largest volumes.

Moving the citrus crop from groves such as this requires the sales department to utilize many types of buyers located throughout the United States.

Use of other methods of sale including consignment, joint account and buying brokers was confined mostly to the sample of North Florida and Interior shippers. Buying brokers accounted for most of this business in all areas. However, some joint account and consignment business was undertaken by North Florida and Interior houses. Auction sales popular in the Indian River area appear to offset the need for joint account and consignment sales used in other areas.

Time Periods

Time periods shown in table 34 represent a division of the 12 sample weeks into quarters each consisting of 3 sample weeks. Data provide a rough estimate of the seasonality of shipments for the 1953-54 season. Data shown for oranges include a number of varieties, each with a different season. Individual varieties of all other types of fruit shown tend to follow uniform seasonal patterns. Generally there is little difference between areas in time of shipment.

In all cases Indian River shipments for the houses sampled were lighter in the first weeks of the season and heavier in the last weeks. Orange and grapefruit shipments were heavier in the second and third quarters than in the first and fourth. Shipments of tangerines were centered in the first and second quarters with the second quarter heavier by far than the first. Mandarin orange shipments, heavy in the second quarter, overlapped tangerine shipments and tapered off into the third quarter. Tangelo shipments followed tangerine shipment patterns very closely, especially in the North Florida area where most were produced.

TABLE 33.--Percentage distribution of fresh citrus shipments by method of sale and production area, 38 Florida packinghouses, 12 sample weeks, 1953-54 season

Production area	Total boxes[1]	Percent shipped by method of sale				
		Auction	Broker	Direct	Other[2]	Total
			Oranges[3]			
	1,000 boxes					
North Florida	890	18.1	48.1	31.0	2.8	100.0
Interior	943	9.1	38.7	41.0	11.2	100.0
Indian River	337	81.6	6.8	11.4	.2	100.0
			Grapefruit			
North Florida	398	8.4	58.3	26.2	7.1	100.0
Interior	958	7.4	35.5	47.4	9.7	100.0
Indian River	940	74.7	13.5	10.6	1.2	100.0
			Tangerines			
North Florida	94	31.0	47.6	17.0	4.4	100.0
Interior	83	23.5	28.4	39.3	8.8	100.0
Indian River	9	79.1	.7	18.5	1.7	100.0
			Mandarin oranges[4]			
North Florida	101	39.5	27.0	28.0	5.5	100.0
Interior	37	39.3	20.0	30.5	10.2	100.0
Indian River	59	97.1	1.8	1.1	--	100.0
			Tangelos			
North Florida	25	28.4	66.6	5.0	(5)	100.0
Interior	1	27.0	18.2	54.8	--	100.0
Indian River	(6)	--	100.0	--	--	100.0

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[1] Adjusted for varying sample rates.
[2] Other includes consignment, joint account, buying broker and sales not identified.
[3] Not including mandarin oranges.
[4] Including Temple and King oranges only.
[5] Less than 0.05 percent.
[6] Less than 500 boxes.

Terms of Sale

Terms of sale vary widely but only two important general classifications bear heavily on a shipper's selling costs. These two classifications are f.o.b. and delivered. Variations in terms of sale center on provisions of inspection and acceptance of commodities.

For the purpose of this study only the two methods were considered. Delivered shipments covered all sales on which transportation costs were paid, including auction sales. F.O.B. shipments covered all sales on which the transportation costs were borne by the buyer.

TABLE 34--Percentage distribution of fresh citrus shipments by time periods and production area, 38 Florida packinghouses, 12 sample areas, 1953-54 season

Production area	Total boxes[1]	Percent shipped by time period[2]					
		1st quarter	2nd quarter	3rd quarter	4th quarter	Not given	Total
			Oranges[3]				
	1,000 boxes						
North Florida	890	18.9	31.3	27.0	22.8	-	100.0
Interior	943	12.8	25.6	33.4	27.2	1.0	100.0
Indian River	337	10.0	33.6	29.5	26.9	-	100.0
			Grapefruit				
North Florida	398	22.7	31.3	28.1	17.4	.5	100.0
Interior	958	22.5	24.8	29.3	23.0	.4	100.0
Indian River	940	18.7	26.4	30.4	24.3	.2	100.0
			Tangerines				
North Florida	94	39.4	58.5	2.0	.1	(4)	100.0
Interior	83	24.6	68.6	6.5	.2	.1	100.0
Indian River	9	15.9	78.4	5.7	(4)	--	100.0
			Mandarin oranges[5]				
North Florida	101	.2	67.0	32.8	--	(4)	100.0
Interior	37	--	77.1	21.4	.3	1.2	100.0
Indian River	59	--	37.5	57.7	1.3	3.5	100.0
			Tangelos				
North Florida	25	35.3	64.6	.1	--	--	100.0
Interior	1	--	100.0	--	--	--	100.0
Indian River	(6)	--	100.0	--	--	--	100.0

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[1] Adjusted for varying sample rates.

[2] The 12 sample weeks were grouped into quarters, each representing 3 sample weeks as follows: 1st quarter includes weeks ending 10-17, 11-7 and 11-28; 2nd quarter includes weeks ending 12-19, 1-9, and 1-30; 3rd quarter includes weeks ending 2-20, 3-13 and 4-3; 4th quarter includes weeks ending 4-24, 5-15 and 6-5.

[3] Not including mandarin oranges.

[4] Less than 0.05 percent.

[5] Including Temple and King oranges only.

[6] Less than 500 boxes.

Table 35 shows the distribution of shipments by terms of sale. Delivered shipments are shown including and excluding shipments made to auction. Auction shipments constitute the most important block of delivered sales although they do not always account for the highest proportion of delivered sales in all areas.

North Florida and Interior shippers included in this study shipped roughly the same proportions of their oranges and grapefruit f.o.b. and delivered but their delivered sales showed a departure from this pattern with North Florida shippers using auction sales more heavily than Interior shippers. Interior shipments of tangerines, mandarin oranges and tangelos were made more frequently on a delivered basis than the shipments of

TABLE 35--Percentage distribution of fresh citrus shipments by terms of sale and production area, 38 Florida packinghouses, 12 sample weeks, 1953-54 season

Production area	Total boxes[1]	Percent shipped by term of sale				
		F.o.b.	Delivered			Total F.o.b. and delivered
			To auction	Other	Total	
			Oranges[2]			
	1,000 boxes					
North Florida	890	72.6	19.8	7.6	27.4	100.0
Interior	943	67.7	8.8	23.5	32.3	100.0
Indian River	337	13.5	81.6	4.9	86.5	100.0
			Grapefruit			
North Florida	398	76.1	10.9	13.0	23.9	100.0
Interior	958	72.9	7.5	19.6	27.1	100.0
Indian River	940	21.6	74.7	3.7	78.4	100.0
			Tangerines			
North Florida	94	62.5	31.7	5.8	37.5	100.0
Interior	83	54.3	23.0	22.7	45.7	100.0
Indian River	9	20.9	79.1	--	79.1	100.0
			Mandarin oranges[3]			
North Florida	101	52.1	42.1	5.8	47.9	100.0
Interior	37	39.7	42.3	18.0	60.3	100.0
Indian River	59	1.6	97.1	1.3	98.4	100.0
			Tangelos			
North Florida	25	64.0	28.4	7.6	36.0	100.0
Interior	1	30.0	27.0	43.0	70.0	100.0
Indian River	(4)	100.0	--	--	--	100.0

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[1] Adjusted for varying sample rates.
[2] Not including mandarin oranges.
[3] Including Temple and King oranges only.
[4] Less than 500 boxes.

North Florida houses. In all cases, with the exception of tangelos, Indian River houses shipped 75 percent or more of their fruit to auctions and very little fruit on a delivered basis otherwise.

Type of Buyer

Table 36 shows the percent of all shipments made to four important types of buyers: chains, wholesalers and jobbers, auction buyers, and pool buyers. Other buyers, no less important but accounting for a smaller share of the 1953-54 shipments of the houses sampled, were export buyers, local buyers at the packinghouses, other shippers, and Government agencies.

TABLE 36.--Percentage distribution of fresh citrus shipments by type of buyer and production area, 38 Florida packinghouses, 12 sample weeks, 1953-54 season

Production area	Total boxes[1]	Percent shipped to type of buyer					
		Chain	Wholesalers and jobbers	Auction	Pool	Other[2]	Total
				Oranges[3]			
	1,000 boxes						
North Florida	890	25.5	42.6	19.8	3.1	9.0	100.0
Interior	943	43.2	34.3	8.8	3.1	10.6	100.0
Indian River	337	1.5	13.1	81.6	.1	3.7	100.0
				Grapefruit			
North Florida	398	22.8	44.9	10.9	4.9	16.5	100.0
Interior	958	47.7	27.8	7.5	2.4	14.6	100.0
Indian River	940	6.4	17.3	74.7	.1	1.5	100.0
				Tangerines			
North Florida	94	9.5	40.9	31.8	5.5	12.3	100.0
Interior	83	31.5	27.5	23.0	2.7	15.3	100.0
Indian River	9	.7	17.8	79.1	--	2.4	100.0
				Mandarin oranges[4]			
North Florida	101	15.0	30.2	42.1	1.0	11.7	100.0
Interior	37	27.2	17.2	42.3	1.7	11.6	100.0
Indian River	59	--	2.9	97.1	--	--	100.0
				Tangelos			
North Florida	25	19.5	39.1	28.4	13.0	(5)	100.0
Interior	1	43.4	12.5	27.0	--	17.1	100.0
Indian River	(6)	--	100.0	--	--	--	100.0

[1] Adjusted for varying sample rates.

[2] Other includes export buyers, local buyers at packinghouses, Government and Quartermaster Corps, inter-plant sales and others not identified.

[3] Not including mandarin oranges.

[4] Including Temple and King oranges only.

[5] Less than 0.05 percent.

[6] Less than 500 boxes.

North Florida houses shipped their largest volume to wholesalers and jobbers, except shipments of mandarin oranges which were heaviest to auctions. Interior houses shipped their largest volumes to chains except again mandarin oranges which went to auctions in heaviest volume. Indian River shippers characteristically shipped in greatest volume during this season to auction markets. Pool buyers accounted for small volumes of all fruit but never more than 6 percent except for tangelos shipped from North Florida.

Practically no shipments were made to pool buyers from the Indian River area except one-tenth of 1 percent of all oranges and grapefruit. Miscellaneous buyers accounted for less than 4 percent of all Indian River shipments but reached as high as 16.5 percent of North Florida grapefruit and 17.1 percent of Interior tangelos.

Market City Location

Market city locations were classified by broad geographic areas and distribution of shipments to these areas is shown in table 37. Markets in the North Atlantic States were very important to Indian River shippers in the 1953-54 season. These markets accounted for 85 percent of the oranges, 63 percent of the grapefruit, 80 percent of the tangerines and 90 percent of the mandarin oranges shipped by houses sampled in the Indian River area. This broad market area was the home of 5 of the 10 auctions operating in the season studied and included the 2 markets handling heavy volumes of Florida fruit, New York and Philadelphia. This undoubtedly accounts for the heavy shipments from Indian River houses.

The North Atlantic States are an area of high population density and so it is not surprising that shippers sampled from other production areas would also ship heavily to this region. But with the exception of mandarin oranges and tangelos, shipments from North Florida and Interior houses to North Central States were in general slightly heavier or about the same as those to the North Atlantic States. Orange, grapefruit and tangerine shipments from these two production areas to South Atlantic States were generally next in order of volume but not far in excess of shipments to the South Central States.

Shipments to Western States accounted for less than 6 percent of all fruit with the exception of tangelos from North Florida which amounted to over 12 percent. Canadian, foreign and unknown destinations were lumped together to conserve space in this table. With the exception of grapefruit from North Florida, Canada accounted for better than one-half of the orange and grapefruit shipments in this broad classification.

U. S. Grades

Table 38 shows the percentages of fruit shipped in the various U. S. grade classifications. Only a very small portion of all fruit shipped fell into those U. S. grades other than No. 1, No. 1 Golden, No. 1 Bronze or No. 2. The 11 percent shown for all other grades of Indian River tangerines was largely No. 1 Russet fruit and the 5 percent shown for grapefruit for this area was largely No. 2 Russet fruit. Almost no fruit was graded No. 1 fancy and No. 1 Bright during this season for the periods and the houses sampled.

Grades used primarily in the Indian River area, Golden and Bronze, were applied to some fruit shipped by North Florida houses, amounting to 10 percent of their oranges and 16 percent of their grapefruit. Otherwise, the bulk of North Florida and Interior oranges and tangerines were graded U.S. No. 1. Grapefruit from these areas graded 68 and 80 percent No. 1, respectively. From 14 to 16 percent of the grapefruit and 22 to 34 percent of the mandarin oranges shipped from all areas were graded U. S. No. 2.

Indian River fruit fell into the Bronze and Golden grades to the extent of 94 percent of the oranges, 80 percent of the grapefruit, 64 percent of the tangerines and 67 percent of the mandarin oranges. In addition tangerines graded out 18 percent straight No. 1. The split between Golden and Bronze grades usually favored the Golden fruit but for grapefruit 49 percent of the shipments were Bronze and 32 percent Golden.

Type of Container

Containers are associated with production areas as much as grades or methods of sale. In fact, all of these factors are interrelated. As a result the data in table 39 show more than the container preferences of a production area, or its customers buying from

TABLE 37.--Percentage distribution of fresh citrus shipments by market city location and production area, 38 Florida packinghouses, 12 sample weeks, 1953-54 season

Production area	Total boxes[1]	Percent shipped by market city location[2]						
		North Atlantic	South Atlantic	North Central	South Central	Western	Canada, foreign and not given	Total
				Oranges[3]				
	1,000 boxes							
North Florida	890	29.2	20.1	26.8	13.8	2.0	8.1	100.0
Interior	943	22.0	20.2	25.2	23.0	1.2	8.4	100.0
Indian River	337	85.1	7.9	1.7	1.0	.5	3.8	100.0
				Grapefruit				
North Florida	398	21.5	11.3	36.0	11.6	5.4	14.2	100.0
Interior	958	19.8	16.7	37.0	11.4	1.8	13.3	100.0
Indian River	940	63.2	2.3	22.1	1.2	5.4	5.8	100.0
				Tangerines				
North Florida	94	30.3	11.7	37.5	9.6	3.8	7.1	100.0
Interior	83	27.3	19.3	30.1	12.6	2.9	7.8	100.0
Indian River	9	79.9	7.1	12.2	.8	--	--	100.0
				Mandarin oranges[4]				
North Florida	101	54.3	10.1	29.3	3.2	1.4	1.7	100.0
Interior	37	37.6	12.4	34.3	8.6	4.0	3.1	100.0
Indian River	59	89.6	.7	9.2	.4	--	.1	100.0
				Tangelos				
North Florida	25	14.9	.7	54.0	3.6	12.4	14.4	100.0
Interior	1	32.7	--	50.2	--	--	17.1	100.0
Indian River	(5)	--	--	--	--	--	100.0	100.0

[1] Adjusted for varying sample rates.

[2] Areas of market city locations include States as follows:

North Atlantic
Maine
New Hampshire
Vermont
Massachusetts
Rhode Island
Connecticut
New York
New Jersey
Pennsylvania

South Atlantic
Delaware
District of Columbia
Maryland
Virginia
West Virginia
North Carolina
South Carolina
Georgia
Florida

North Central
Ohio
Indiana
Illinois
Michigan
Wisconsin
Minnesota
Iowa
Missouri
North Dakota
South Dakota
Nebraska
Kansas

South Central
Kentucky
Tennessee
Alabama
Mississippi
Arkansas
Louisiana
Oklahoma
Texas

Western
Montana
Idaho
Wyoming
Colorado
New Mexico
Arizona
Utah
Nevada
Washington
Oregon
California

[3] Not including mandarin oranges.

[4] Including Temple and King oranges only.

[5] Less than 500 boxes.

TABLE 38.--Percentage distribution of fresh citrus shipments by U. S. grades and production area, 38 Florida packinghouses, 12 sample weeks, 1953-54 season

Production area	Total boxes[1]	Percent shipped as U. S. grades					
		No. 1	No. 1 golden	No. 1 Bronze	No. 2	All others	Total
			Oranges[2]				
	1,000 boxes						
North Florida	890	89.1	10.1	.6	(3)	.2	100.0
Interior	943	97.2	.8	(3)	.2	1.8	100.0
Indian River	337	4.8	50.1	44.0	.5	.6	100.0
			Grapefruit				
North Florida	398	67.7	15.7	.5	14.5	1.6	100.0
Interior	958	79.7	1.6	1.8	15.5	1.4	100.0
Indian River	940	1.2	31.7	48.8	13.6	4.7	100.0
			Tangerines				
North Florida	94	94.8	1.1	--	.9	3.2	100.0
Interior	83	93.3	--	--	6.0	.7	100.0
Indian River	9	17.6	37.1	26.5	8.0	10.8	100.0
			Mandarin oranges[4]				
North Florida	101	77.9	.4	.1	21.6	(3)	100.0
Interior	37	65.9	--	--	33.8	.3	100.0
Indian River	59	.4	34.3	32.4	32.9	--	100.0
			Tangelos				
North Florida	25	99.7	--	--	.3	--	100.0
Interior	1	100.0	--	--	--	--	100.0
Indian River	(5)	100.0	--	--	--	--	100.0

[1] Adjusted for varying sample rates.
[2] Not including mandarin oranges.
[3] Less than 0.05 percent.
[4] Including Temple and King oranges only.
[5] Less than 500 boxes.

that production area. The preferences may be for a particular method of selling which has adhered to a certain type of container or perhaps for a particular type of buyer whose needs are met in part with bagged fruit rather than boxed fruit.

Shipments of 89 percent of the oranges and 96 percent of the grapefruit from the Indian River area were made in the 1 3/5 bushel nailed box. Another 10 percent of the oranges and 2.5 percent of the grapefruit went in the 1 3/5 bushel wirebound box, leaving little to be shipped in any other type of container.

Oranges and grapefruit shipped by North Florida and Interior houses were packed mostly in 1 3/5 bushel wirebound boxes, accounting for 79 and 66 percent of the oranges and 90 and 89 percent of the grapefruit. Next most frequently used container for oranges and grapefruit in these areas was the 5 and 8 pound bag.

TABLE 39.--Percentage distribution of fresh citrus shipments by type of container and production area, 38 Florida packinghouses, 12 sample weeks, 1953-54 season

Production area	Total boxes[1]	Percent shipped in containers						
		1 3/5 bushel nailed	1 3/5 bushel wire-bound	All 4/5 bushel boxes	8 pound bags	5 pound bags	All other[2]	Total
				Oranges[3]				
	1,000 boxes							
North Florida	890	.8	78.8	.3	5.6	6.4	8.1	100.0
Interior	943	2.4	65.8	1.5	15.3	7.9	7.1	100.0
Indian River	337	89.4	10.0	.1	(4)	(4)	.5	100.0
				Grapefruit				
North Florida	398	.1	90.0	.1	2.9	3.7	3.2	100.0
Interior	958	.2	88.8	.7	5.5	2.8	2.0	100.0
Indian River	940	95.5	2.5	.2	--	(4)	1.8	100.0
				Tangerines				
North Florida	94	--	.2	99.6	--	--	.2	100.0
Interior	83	--	--	99.8	--	--	.2	100.0
Indian River	9	--	--	100.0	--	--	--	100.0
				Mandarin oranges[5]				
North Florida	101	--	1.9	98.0	--	--	.1	100.0
Interior	37	--	--	99.9	--	--	.1	100.0
Indian River	59	10.6	--	89.1	--	--	.3	100.0
				Tangelos				
North Florida	25	--	3.9	96.1	--	--	--	100.0
Interior	1	--	--	100.0	--	--	--	100.0
Indian River	(6)	100.0	--	--	--	--	--	100.0

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[1] Adjusted for varying sample rates.
[2] All other includes 4/5 bushel bags, 20 pound bags, 4/5 bushel cartons, bulk shipments and a limited number of other miscellaneous containers.
[3] Not including Mandarin oranges.
[4] Less than 0.05 percent.
[5] Including Temple and King oranges only.
[6] Less than 500 boxes.

Tangerines, mandarin oranges and tangelos were shipped in a variety of 4/5 bushel boxes. These are to be distinguished from the 4/5 bushel carton which had been introduced to the Florida citrus industry prior to the 1953-54 season but had not at that time had very wide usage. Cartons were grouped under all other containers.

APPENDIX

This appendix provides the researcher and others interested with details of the research procedure. Number of observations forming the basis for net return comparisons are included as supplements to text tables. Also provided are definitions of some of the more technical terms used in the study.

Method of Analysis

The analysis used in this study can be considered in three parts: The sampling procedure, the qualifications and limitations, and the methods employed in making net return comparisons.

Sampling Procedure

A sample of packinghouses in three primary producing areas of Florida--North Florida, Interior and Indian River--was selected by dividing all shippers into seven volume groups according to total volume of certified shipments in the 1953-54 season. In net return comparisons data for North Florida and Interior areas were combined and reported as Interior data. This was possible because of the similar production and marketing characteristics of these areas. For each volume group a packinghouse was selected at random representing the federated type of sales organization. These houses were matched with packinghouses representing the nonfederated type sales organization with consideration being given to type of fruit shipped and location with respect to markets, production area and shipping facilities.

The volume groups were as follows:

Group	1,000 boxes shipped
1	Over 900
2	600 - 899
3	450 - 599
4	327 - 449
5	200 - 326
6	90 - 199
7	50 - 89

Packinghouses were not available for sampling in some volume groups in all areas. This was due to nonexistence or inability of a limited number of shippers to cooperate in this study. Some substitutions were made in instances where organizations were not available.

Three schedules were used in obtaining data from these packinghouses. Schedule I was obtained largely by personal interview. It concerns the management's views on pricing policies and sales practices.

Schedule II provided for listing the data pertaining to each individual lot of fruit in the shipments sampled to determine net return to the shipper.

These shipments were sampled from every third week of the 36 week season, October 4, 1953, to June 12, 1954, according to the volume shipped by each packinghouse as follows:

Volume groups	1,000 boxes	Shipments sampled
1 - 2	600 and over	Every third
3 - 5	200 - 599	Every second
6 - 7	50 - 199	All

Using these criteria for sampling the shipping records, Schedule II was completed for the 38 packinghouses included in the study. The data from these schedules formed the basis for the major findings.

Schedule III was an accounting of expenses incurred in selling fruit, giving a total sales expense from which a per box sales department cost could be derived.

Qualifications and Limitations of the Study

In this study, f.o.b. net returns to shippers provided the measure of sales department effectiveness in determining the relationships between methods of sale, types of buyers and other factors of importance in developing a citrus sales program. Net return to shipper includes the price received by the shipper for his packed fruit after all selling, transportation and other marketing costs have been deducted but does not include deductions for the cost of picking, hauling to the plant, or packing the fruit. It is the return the shipper gets for a packed box of fruit at the time the sales organization takes on the job of moving that fruit from the packinghouse door.

Shippers pack fruit according to type, variety, grade and size in various types of containers and frequently under two or more brand names. This fruit is sold by various methods of sale to many types of buyers in many market cities at various times during the shipping season. All of these variables may affect returns to shippers. Comparisons must be made with the possible effects of these variables on net returns and marketing conditions accounted for and clearly defined. This creates a situation where analysis must be limited to a small number of variables in order to have meaningful results.

Differences in net returns can be attributed to many characteristics such as type and variety of fruit, grade, size and others which are known and in most cases measurable. However, additional factors are present which may influence returns to shippers but such factors may not be apparent from records and many are not measurable. For instance, industry leaders will frankly admit that there is wide variability in quality of fruit within grades. These differences may be due to a variety of reasons ranging from a deliberate attempt of growers and a shipper or both to put up a superior quality pack or possibly may result from weather conditions that affect only a part of the production area.

When differences in net returns to shippers occur within grades, there can justifiably be a question of how much is due to sales organization effectiveness and how much may be due to physical differences in fruit quality, or to some other factors. Use of these data should be accompanied by the knowledge that these quality differences within grades, as well as other factors, can and do affect net returns to shippers.

In tabulating sales data no distinction was made between lots of color-add and natural color oranges. This can be considered a limiting factor but not necessarily a major one. There is some doubt about the extent to which this factor affects prices, in some markets and in some seasons.

In the 1953-54 season, natural color fruit probably did not command a premium over color-add fruit as often as in subsequent seasons. Florida Citrus Mutual's Daily Market Bulletin listed a price differential on only 4 or 5 days in that season as compared with many such quotations in the seasons that followed.

Tabulation of the volume of orange shipments for the Interior area showed that color-add fruit accounted for 90 percent of the sales of 11 federated houses and 74 percent of the sales of 13 nonfederated houses. Eliminating three[1] of the heavy natural color shippers from the 13 nonfederated houses reduced their number to 10 and raised the proportion of color-add fruit to 88 percent as compared to the 90 percent shipped by the 11 federated houses. Considering these two groups of 10 nonfederated and 11 federated houses, the proportion of color-add fruit is comparable.

A similar tabulation of color-add shipments for Indian River houses sampled showed only one house with any appreciable volume of color-add fruit. This house did not enter into net return comparisons because of other important considerations. This left color-add shipments accounting for 3 percent of the volume of eight nonfederated houses with five federated houses shipping no color-add fruit. This 3 percent represents so small a volume that it appears to be unimportant.

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[1] One of three heavy natural color shippers did not actually affect tabulations of net returns for Valencia oranges in this study since it was heavy in proportion of shipments but not in volume, and the data sampled did not include any information on this fruit.

It would appear that there might be some advantage to the nonfederated shippers in the Interior area when discounts were important in this season. The problem of color-add fruit is examined in discussing net returns by type of sales organization.

It is only in comparisons by type of sales organization that returns for different houses are compared. Thus, in all other comparisons where net returns are compared within houses, the influence of natural color premiums are minimized.

Included in the combination of factors that influence growers' returns for fresh fruit are the costs of picking, hauling, and packing. These cost factors are outside the scope of this study and are fully treated in other studies relating to the Florida situation.[2]

The bulk of Indian River fruit is graded U. S. No. 1 Golden or U. S. No. 1 Bronze, compared with fruit from other areas that is graded primarily U. S. No. 1. Shippers interviewed in the Indian River section were, with the exception of one small house, heavy users of terminal auction markets as contrasted with shippers in other areas. Fruit shipped to auction markets is normally packed in a 1 3/5 bushel nailed box. It is more expensive to use than the wirebound container used in other areas where shipments are primarily to order buyers or for f.o.b. sales. This along with other considerations makes net return comparisons between Indian River and Interior areas of limited value.

Indian River shippers have been successful in their attempt to gain special recognition for their products. This has been accomplished by an extensive advertising program coupled with the identification of all fruit by marking each individual piece with the words "Indian River."

Comparison of net returns to shippers are restricted by many of the foregoing limitations. It is possible to eliminate some of these problems by holding some of the variables constant in the analysis or by limiting comparisons to well defined areas. Any interpretation of these data should consider these problems.

Methods of net return comparison analysis

This analysis represents an attempt to determine the effects of several variables upon returns for Valencia oranges and white seedless grapefruit. The data included in this analysis are but a small part of all data collected from the 1953-54 sales records of 38 Florida fresh citrus shippers. Data concerning each individual lot of fruit listed on sale manifests sampled were placed on punch cards.

Net returns were analyzed by direct comparison of sales records of lots of fruit or combinations of like lots of fruit. The comparisons were made from tabulations of summary cards which represent several individual punch cards which in turn represent separate but identical lots of fruit. For example, as many as 1,640 boxes of fruit may have been tabulated on a summary card for Valencia oranges.

A single comparison, or observation, was made only when all the variables, except the one under observation, could be held constant. This can be called a matched lot observation. For instance, in comparing net returns for two different sizes of fruit, an observation could be made only if these sizes were of the same grade, packed in the same type container, sold by the same method of sale to the same type of buyer, from the same packinghouse in the same week.

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[2] Spurlock, A.H., Costs of Picking and Hauling Florida Citrus Fruits, 1953-54 Season. A.E. Mimeo Report #55-5, Dept. of Agric. Econ., Fla. Agric. Exper. Sta., 15 pp, Jan. 1955, and Thor, Eric and Spurlock, A.H., Costs of Packing and Selling Florida Fresh Citrus Fruits, A.E. Mimeo. Report #55-4, Dept. of Agric. Econ., Fla. Agric. Exper. Sta., and Farmer Cooperative Service of U. S. Dept. of Agri. cooperating, 21 pp., Jan. 1955.

APPENDIX TABLE 1.--Work table with explanation showing method of making net return comparisons for Interior Valencia oranges of size 150 with size 176 as sold at auction

(U. S. No. 1 fruit, packed in 1-3/5 bushel wirebound boxes, data from 22 packinghouses[1], 6 sample weeks, 1953-54 season)

Week ending	Packing-house code number	Size 150		Size 176		150 compared with 176
		Number of boxes	Average return	Number of boxes	Average return	
			Dollars		*Dollars*	*Dollars*
2-20-54	01	60	2.491	50	3.126	-0.635
	06	65	2.093	767	1.951	+ .142
	07	177	2.430	95	2.268	+ .162
3-13-54	02	144	2.593	125	2.900	- .307
	04	431	2.239	395	2.481	- .242
	06	534	2.376	606	2.769	- .393
	07	68	2.121	136	2.024	+ .097
	17	100	.744	159	.897	- .153
	28	52	2.016	140	2.191	- .175
	41	55	1.740	117	1.896	- .156
4-3-54	02	1,528	2.166	1,622	2.279	- .113
	04	389	2.094	695	2.100	- .006
	06	72	2.193	1,220	1.861	+ .332
	17	32	2.437	213	2.226	+ .211
	20	28	2.096	111	2.251	- .155
4-24-54	02	744	3.088	1,643	3.265	- .177
	04	151	2.552	273	2.887	- .335
	06	309	2.650	823	2.714	- .064
	17	20	2.310	116	2.538	- .228
	24	174	2.519	172	2.819	- .300
5-15-54	02	1,407	3.719	1,145	4.040	- .321
	04	276	3.274	440	3.556	- .282
	06	120	3.197	567	3.524	- .327
	41	38	3.261	12	3.505	- .244
6-5-54	02	1,320	3.953	1,276	4.314	- .361
	04	1	3.058	5	3.058	.000
	06	29	3.094	480	3.445	- .351
	08	78	3.088	274	3.504	- .416
	Total	8,402	71.592	13,677	76.389	-4.797
	Average (28 observations)		2.557		2.728	- .171

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[1] Of the 22 packinghouses shipping Valencia oranges, only those that used this particular sales method or met other conditions specified here were included in the comparison.

NOTE: Of 28 observations recorded above, 5 show size 150 fruit averaging more per box than size 176 fruit, 22 show size 150 fruit averaging less per box than size 176 fruit and 1 shows returns to be equal. Therefore, by the standards selected for this analysis a significant number of observations (27) show differences in net returns and further, a significant number of observations (22) show size 150 fruit averaging less per box than size 176 fruit. This difference in net returns averages 17.1 cents a box.

As can be readily seen, this method of comparison is extremely limiting since the total amount of available data is spread across all variables in broad combination. However, analysis has shown that these limitations were necessary because of differences in net returns associated with all variables analyzed. Furthermore, variations in net return differences are in some cases quite erratic. When the variables are held constant in making comparisons, such erratic behavior of net return differences is restricted to the variables under consideration so far as it is possible in the available data.

Because net return differences for each individual matched lot observation represent a difference for the major variable, only these could be totaled and an average difference calculated for the comparison. For example, in the comparison of returns for Valencia orange sizes 150 and 176 in appendix table 1, all fruit was graded U. S. No. 1, packed in 1 3/5 bushel wirebound boxes and sold at auction. However, it was shipped by a number of houses over several weeks which required that the analysis first compare lots of fruit that came from one house during one week. The resulting net return differences for these individual matched lot observations could then be totaled and averaged for the season without regard for the minor variables such as house.

Appendix table 1 presents a work table tabulation used to determine the net return differences for a comparison of sizes 150 and 176 Valencia oranges. Net return differences for other sizes of both Valencia oranges and white seedless grapefruit were tabulated in a similar manner. However, average net returns for any given size of fruit may vary from one comparison to another because those lots of fruit which can be matched in one size comparison will not necessarily have a counterpart in another comparison involving a different fruit size.

Results of Comparisons.--Each comparison of any given matched pair of variables could be expected to produce one of three different results. Either there would be a difference in net returns in (1) a positive direction; (2) a negative direction; or (3) there would be no difference in net returns. The behavior of these comparisons was expected to vary with the variables being compared and with other variables which entered into the comparison.

Results were tabulated to show the direction of those differences which occurred and the average differences in net returns. The results of tests used to indicate the significance of the departure of the median of such distributions from zero were also tabulated. Tables in the text summarize net return differences while data on number of observations are summarized in the appendix.

Significance of the Median Difference.--Significance of the median difference in net returns was tested using the "sign test of significance." This is a nonparametric test which allows a comparison between two distributions without specifying the form of the distributions. The test merely requires that the number of positive and negative differences observed in a given set of paired, or matched lot, observations be counted; by reference to a table of probability values significance can be determined.[3]

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[3] National Bureau of Standards, Tables of the Binomial Probability Distribution, Applied Mathematics Series 6, U. S. Dept. of Commerce, pp. x and 287 1949. Romig, Harry G. 50-100 Binomial Tables, Wiley and Sons, New York, pp. xxvii and 172 1953. For distributions where the total number of observations exceeded 100, a value of t was computed as:

$$t = \frac{p - q}{\sqrt{\frac{p(1-p)}{n}}}$$

Where t = the deviation of the sample proportion
p = proportion of observations to be tested
q = prescribed minimum level of differences
n = total observations

This value was then found in a t table and compared to the deviation which could have arisen from sampling fluctuations at the 0.05 level of significance.

With this simple test, the relative frequency of those observations showing differences as opposed to those showing no differences was also tested. The hypothesis here was that differences either minus or plus would occur at least two-thirds of the time as compared with no differences occurring one-third of the time or less.

It appeared practical to require that any test for more positive than negative differences (or the reverse) be subject to the condition that at least two-thirds of the observations show differences, either plus or minus. The partial sum table of binomial probability tables serve as a useful guide to the decision as to whether the relative frequency of observations showing differences is significantly greater than two-thirds.

If on the foregoing basis significance is established, a second hypothesis is considered.

Differences in net returns are considered to be divided equally between those in a positive direction and those in a negative direction. Again, the probability values can be read directly from the partial sums tables with due consideration for the need of a one or two-tailed test. A one-tailed test was used when there were logical reasons for expecting more differences of one sign than of another; otherwise a two-tailed test was used. The two-tailed test simply doubles the requirements of the one-tailed test. In determining the significance of positive or negative observations the two-tailed test was used only in the comparison of federated with nonfederated sales organizations.

For the purposes of this study the conventional 5 percent probability level was considered as indicating significance.

Average differences in net returns to shippers for paired variables are shown in the tables. These differences should be considered in terms of their magnitude. Low values are usually accompanied by less than significant separations of differences and nondifferences in observations and/or less than significant separations in direction of differences.

Number of Observations.--The term ''observation'' or ''matched lot observation'' has a special meaning as it applies to net return comparisons undertaken in this study. This rather special meaning together with the variations which occur in the composition of an observation makes some detailed explanation desirable.

An observation is a comparison between individual lots or several lots of fruit which are identical or matched in all respects except for the variable being analyzed. This means that the weighted average net return per box for all fruit of a given description is compared with the weighted average net return per box for all fruit which fits the identical description except for the one variable being compared.

As it becomes possible to consider a smaller number of factors in making an individual comparison or observation, the total number of observations for the season or overall comparison will be affected. If data are incomplete in many categories, consideration of fewer variables might produce more observations by allowing some cross comparisons as was the case in method of sale comparisons when type of buyer was not a limiting factor. If on the other hand, data are relatively complete for all categories, total number of observations may decrease when number of controlling variables is limited. This was the case for sales organization comparisons where only physical factors and the main variable were controlling.

The requirements for establishing statistical significance cannot in any event be relaxed because an increased volume of fruit is represented in an observation. Observations based on large volumes of fruit are not necessarily more reliable than observations based on smaller volumes, particularly when increased volume is attained by combining data which are subject to individual variations. Furthermore, data are usually combined only because number of observations in sub-categories were inadequate to provide a meaningful comparison.

The following tables are tabulations of the number of observations on which net return comparisons were based and from which statistical significance was determined for each net return difference shown in text tables. These tables supplement text tables with entries following text table entries line for line.

APPENDIX TABLE 2.--Number of observations for size of fruit comparisons, all sales methods, Interior shipments (supplements text table 18)

Fruit	Marketing period	Number of observations showing net return differences			
		More than	Less than	Equal	Total
		Size 64 compared with size 70			
White seedless grapefruit	Early	23	13	47	83
	Mid	29	11	37	77
	Late	15	9	28	52
	All	67	33	112	212
		Size 70 compared with size 80			
	Early	39	13	18	70
	Mid	30	15	10	55
	Late	13	12	17	42
	All	82	40	45	167
		Size 80 compared with size 96			
	Early	48	8	9	65
	Mid	45	12	14	71
	Late	16	10	17	43
	All	109	30	40	179
		Size 150 compared with size 176			
Valencia oranges	All	18	132	30	180
		Size 176 compared with size 200			
	All	33	72	73	178
		Size 200 compared with size 216			
	All	38	63	69	170

APPENDIX TABLE 3.--Number of observations for size of fruit comparisons, auction sales only, Interior shipments (supplements text table 19)

Fruit	Marketing period	Number of observations showing net return differences			
		More than	Less than	Equal	Total
		Size 64 compared with size 70			
White seedless grapefruit	Early	7	1	--	8
	Mid	7	3	2	12
	Late	4	1	1	6
	All	18	5	3	26
		Size 70 compared with size 80			
	Early	6	2	--	8
	Mid	6	4	1	11
	Late	5	1	1	7
	All	17	7	2	26
		Size 80 compared with size 96			
	Early	6	1	--	7
	Mid	3	3	--	6
	Late	2	--	3	5
	All	11	4	3	18
		Size 150 compared with size 176			
Valencia oranges	All	5	22	1	28
		Size 176 compared with size 200			
	All	2	26	--	28
		Size 200 compared with size 216			
	All	9	17	2	28

APPENDIX TABLE 4.--Number of observations for size of fruit comparisons, broker and direct sales, Interior shipments (supplements text table 20)

Fruit	Marketing period	Number of observations showing net return differences			
		More than	Less than	Equal	Total
			Size 64 compared with size 70		
White seedless grapefruit	Early	16	12	47	75
	Mid	22	8	35	65
	Late	11	8	27	46
	All	49	28	109	186
			Size 70 compared with size 80		
	Early	33	11	18	62
	Mid	24	11	9	44
	Late	8	11	16	35
	All	65	33	43	141
			Size 80 compared with size 96		
	Early	42	7	9	58
	Mid	42	9	14	65
	Late	14	10	14	38
	All	98	26	37	161
			Size 150 compared with size 176		
Valencia oranges	All	13	110	29	152
			Size 176 compared with size 200		
	All	31	46	73	150
			Size 200 compared with size 216		
	All	29	46	67	142

APPENDIX TABLE 5.--Number of observations for size of fruit comparisons, all sales, Indian River shipments (supplements text table 21)

Fruit	Marketing period	Number of observations showing net return differences			
		More than	Less than	Equal	Total
		Size 64 compared with size 70			
White seedless grapefruit	Early	87	5	19	111
	Mid	102	6	16	124
	Late	61	30	8	99
	All	250	41	43	334
		Size 70 compared with size 80			
	Early	94	1	14	109
	Mid	107	12	7	126
	Late	67	23	8	98
	All	268	36	29	333
		Size 80 compared with size 96			
	Early	81	15	16	112
	Mid	85	36	13	134
	Late	79	11	7	97
	All	245	62	36	343
		Size 150 compared with size 176			
Valencia oranges	All	14	54	7	75
		Size 176 compared with size 200			
	All	22	48	16	86
		Size 200 compared with size 216			
	All	49	20	18	87

APPENDIX TABLE 6.--Number of observations for size of fruit comparisons, auction sales, Indian River shipments (supplements text table 22)

Fruit	Marketing period	Number of observations showing net return difference			
		More than	Less than	Equal	Total
			Size 64 compared with size 70		
White seedless grapefruit	Early	82	1	2	85
	Mid	92	5	--	97
	Late	37	29	4	70
	All	211	35	6	252
			Size 70 compared with size 80		
	Early	84	1	--	85
	Mid	90	7	--	97
	Late	50	17	3	70
	All	224	25	3	252
			Size 80 compared with size 96		
	Early	65	15	4	84
	Mid	59	33	4	96
	Late	59	8	1	68
	All	183	56	9	248
			Size 150 compared with size 176		
Valencia oranges	All	12	48	1	61
			Size 176 compared with size 200		
	All	15	45	1	61
			Size 200 compared with size 216		
	All	45	16	--	61

APPENDIX TABLE 7.--Number of observations for size of fruit comparisons, broker and direct sales, Indian River shipments (supplements text table 23)

Fruit	Marketing period	Number of observations showing net return differences			
		More than	Less than	Equal	Total
		Size 64 compared with size 70			
White seedless grapefruit	Early	5	4	17	26
	Mid	10	1	16	27
	Late	24	1	4	29
	All	39	6	37	82
		Size 70 compared with size 80			
	Early	10	--	14	24
	Mid	17	5	7	29
	Late	17	6	5	28
	All	44	11	26	81
		Size 80 compared with size 96			
	Early	16	--	12	28
	Mid	26	3	9	38
	Late	20	3	6	29
	All	62	6	27	95
		Size 150 compared with size 176			
Valencia oranges	All	2	6	6	14
		Size 176 compared with size 200			
	All	7	3	15	25
		Size 200 compared with size 216			
	All	4	4	18	26

APPENDIX TABLE 8.--Number of observations for grade comparisons, Indian River shipments (supplements text table 25)

Fruit	Method of sale	Number of observations showing net return differences			
		More than	Less than	Equal	Total
		U. S. No. 1 Golden compared with U. S. No. 1 Bronze			
White seedless grapefruit	Auction	402	69	5	476
	Broker and Direct	67	10	79	156
	All	469	79	84	632
Valencia oranges	Auction	124	--	--	124
	Broker and Direct	8	10	16	34
	All	132	10	16	158

APPENDIX TABLE 9.--Number of observations for type of buyer comparisons (supplements text table 26)

Fruit	Method of sale	Number of observations showing net return differences			
		More than	Less than	Equal	Total
		Wholesalers compared with chains			
White seedless grapefruit	Broker	17	19	6	42
	Direct	4	24	8	36
	Broker and direct	21	43	14	78
Valencia oranges	Broker	20	33	4	57
	Direct	8	26	5	39
	Broker and direct	28	59	9	96
		Other buyers compared with wholesalers			
White seedless grapefruit	Broker	37	46	33	116
	Direct	12	7	5	24
	Broker and direct	49	53	38	140
Valencia oranges	Broker	41	43	9	93
	Direct	12	5	6	23
	Broker and direct	53	48	15	116
		Other buyers compared with chains			
White seedless grapefruit	Broker	12	13	3	28
	Direct	18	14	2	34
	Broker and direct	30	27	5	62
Valencia oranges	Broker	11	18	10	39
	Direct	19	12	1	32
	Broker and direct	30	30	11	71

APPENDIX TABLE 10.--Number of observations for method of sale comparisons, Interior shipments by type of buyer (supplements text table 27)

Fruit	Type of buyer	Number of observations showing net return differences			
		More than	Less than	Equal	Total
			Direct compared with broker		
White seedless grapefruit	Chain	14	3	1	18
	Wholesaler	42	18	6	66
	Other	26	3	2	31
	All	82	24	9	115
Valencia oranges	Chain	29	--	--	29
	Wholesaler	26	12	3	41
	Other	7	1	7	15
	All	62	13	10	85

APPENDIX TABLE 11.--Number of observations for method of sale comparisons, Interior area shipments, regardless of type of buyer (supplements text table 28)

Fruit	Number of observations showing net return differences			
	More than	Less than	Equal	Total
		Auction compared with broker		
White seedless grapefruit	7	38	--	45
Valencia oranges	32	60	--	92
		Auction compared with direct		
White seedless grapefruit	3	28	--	31
Valencia oranges	10	27	--	37
		Direct compared with broker		
White seedless grapefruit	138	47	6	191
Valencia oranges	129	29	7	165

APPENDIX TABLE 12.--Number of observations for method of sale comparisons, Indian River shipments, regardless of type of buyer (supplements text table 30)

Fruit	Marketing period	Number of observations showing net return differences			
		More than	Less than	Equal	Total
		Auction compared with broker			
White seedless grapefruit	Early	43	53	--	96
	Mid	62	63	--	125
	Late	35	51	--	86
	All	140	167	--	307
		Auction compared with direct			
	Early	15	23	--	38
	Mid	5	13	--	18
	Late	18	23	--	41
	All	38	59	--	97
		Direct compared with broker			
	Early	2	--	--	2
	Mid	3	1	--	4
	Late	18	8	--	26
	All	23	9	--	32

APPENDIX TABLE 13.--Number of observations for type of sales organization comparison (supplements text table 31)

Production area	Fruit	Number of observations showing net return differences			
		More than	Less than	Equal	Total
		Federated compared with nonfederated			
Interior	White seedless grapefruit	26	22	--	48
	Valencia oranges	18	6	--	24
	Valencia oranges[1]	18	6	--	24
Indian River	White seedless grapefruit	50	46	--	96
	Valencia oranges	15	9	--	24

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[1] This comparison is the same as the one above, except that two packinghouses selling predominantly natural color fruit are excluded.

Definition of Terms Used in Study

Auction sale - sale made at one of the terminal market fruit auctions.

Boxes - the common standard of measurement for citrus is a box holding about 1 3/5 bushel in the Gulf States and about $1\frac{1}{2}$ bushel in Western States. Net weight varies with production area as follows:

Oranges:	Florida, Texas and Louisiana	90 pounds
	California and Arizona	77 pounds
Grapefruit:	Florida and Texas	80 pounds
	California Desert Valleys and Arizona	65 pounds
	Other California Areas	68 pounds
Tangerines:	Florida	90 pounds

Broker sale - sale made through an agent representing a distant shipper.

Buying broker sale - sale made through an agent representing a distant buyer.

Color-add - term applied to citrus fruit which has been colored to give it a more attractive appearance.

Consignment sale - sale where fruit or other produce is consigned to a commission merchant to be sold on commission.

Differential - a premium or discount allowed from the prevailing selling price because of some special quality, desirable or undesirable.

Direct sale - sale made directly to a buyer without the services of an intermediary agent.

Fresh fruit (citrus) - fruit purchased or shipped for sale as fresh fruit as contrasted with fruit purchased for processing. See "fruit."

Fruit (citrus) - fruit including oranges, grapefruit, tangerines, mandarin oranges and tangelos.

House - see "packinghouse."

Mandarin orange - including the King and Temple varieties.

Marketing period - that part of the 1953-54 marketing season represented by the 12 sample weeks or group of the 12 sample weeks. Valencia oranges were shipped in volume in only the last 6 of the 12 sample weeks while white seedless grapefruit were shipped during all 12 weeks. For some net return comparisons the marketing period for white seedless grapefruit was divided as follows:

Early marketing period - sample weeks ending 10-17, 11-7, 11-28 and 12-19.
Mid marketing period - sample weeks ending 1-9, 1-30, 2-20 and 3-13.
Late marketing period - sample weeks ending 4-3, 4-24, 5-15 and 6-5.

Natural color - term applied to oranges not artificially colored. See color-add.

Net return to shipper - the price received by a shipper for packed fruit after all selling, transportation and other marketing costs have been deducted from the gross sales price, but does not include deductions for picking, hauling to packinghouse or packing of fruit.

Observation - a comparison of net returns for two quantities of fruit comprising one to several lots but identical in all respects except for the variable being analyzed. (See appendix for a fuller explanation)

Other buyers - these include local buyers at packinghouses, Government and Quartermaster Corps, pool buyers, other plants, and others not identified.

Packinghouse - the plant where fruit is cleaned, sorted, graded and packed and the place from which it is shipped to market. As used in this report it means the shipping organization and is used interchangeably with ''shipper'' or ''house.''

Premium - a price differential asked or allowed for superior quality of fruit. See differential.

Sales agency - the organization that has responsibility for selling fresh citrus fruit. This may be the shipping organization or a separate organization whose sole responsibility is to sell fruit. Term used interchangeably with sales department or sales organization.

Sales department - the department of a shipping organization or the independent sales agency whose responsibility is to sell fruit. Term used interchangeably with sales agency or sales organization.

Sales organization - see sales agency and sales department.

Shipper - the organization that has fruit to ship as distinguished from the sales organization that has responsibility for selling the fruit. This may in some instances be identical with sales organization. See house and packinghouse.

Slow moving fruit - citrus fruit that is difficult to sell as compared with similar fruit of more desirable size, grade or other characteristic.

Variable - a factor such as size, grade, time, method of sale, type of buyer or other factor relating to the classification of fruit or its sale. A factor to be analyzed.

Wholesaler - for the purposes of this study the term wholesaler applies to wholesalers, jobbers, receivers and others that buy in carlots or less than carload lots for resale to other than retail buyers. This excludes chain, pool, local packinghouse and Government buyers.

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